3953

BULLETIN No. 16

THE RAILWAY AND LOCOMOTIVE
HISTORICAL SOCIETY

BULLETIN No. 16

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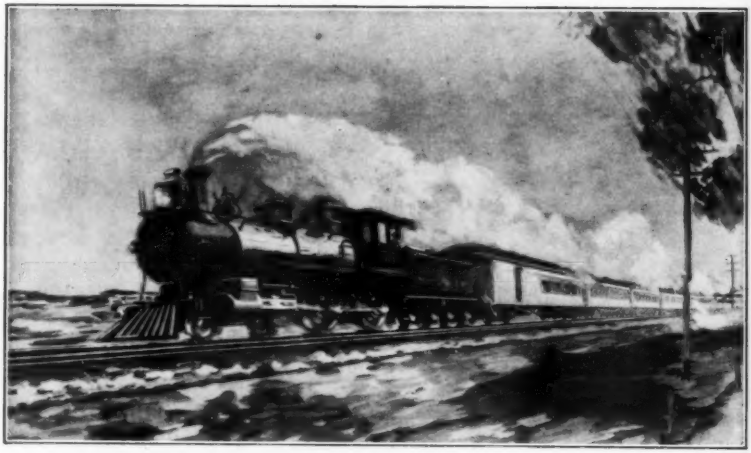
ISSUED BY
The Railway and Locomotive Historical Society
Baker Library, Harvard Business School
Boston, Massachusetts
May 1928



The "White Train" on the New York & New England R. R.

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As stated in our last issue, in order that our bulletin may be improved and brought in closer touch with our members, it was decided to appoint six chairmen to select their committees, to locate and furnish material for publication. With the exception of a New England Committee which will be added at a later date, the above committees have already started to function.

In this bulletin we present the beginning of a series of articles on the design of historic locomotives. These articles appeared in "Loco" a few years ago and were so interesting on our own subject, it was felt our members would be interested in their reproduction.

Our railroads of the middle west, at first using locomotives built in New England and the East, have always been an interesting topic of historical research, mainly because little was known about them. We have in this issue a brief and interesting history of what was the parent of the present "Big Four System".

From England comes some very interesting notes on the broad guage road, seven foot gauge, to Plymouth, England. Many of us remember the reproductions of these locomotives with their huge driving wheels that appeared years ago in "Railway & Locomotive Engineering" and other magazines. Mr. Shapcote has given us some very interesting personal sidelights on this road. We all lived as boys, on some railroad line or lines. What are your personal recollections of the early locomotives and cars as you saw them through your boyish eyes?

In the list of New York & Erie locomotives for 1856 we have a valuable reference work. The little road in Ireland is also of interest.

For some time very interesting letters came from the pen of a man named George Haggerty. Mr. Haggerty's railroad experience covered thirty-eight years in different sections. Born and reared in Norfolk County, his recollections of the old roads and the Boston, Hartford & Erie R. R. will be of interest to us and other letters will follow. His untimely death a few years ago lost to us further interesting recollections.

In another article we have told you a little bit about this Society, tracing briefly the growth and our entrance to the Baker Library. We have an exhibition here that we may well be proud. The walls of two rooms include three hundred framed photographs of locomotives, railroad stations, timetables, etc. We have original timetables dating back to the forties and fifties, tickets, conductor's checks, lanterns, etc. all of which will be of interest to you and your friends. This material is being catalogued and as soon as possible a list of this material will be printed for each member. Many of our members have already visited the room and as time passes we hope that any of our members who are in Boston or vicinity will visit our room and inscribe their names on our register.

Our cover is a reproduction of the "Black Fox" of the Central Pacific R. R., drawn by Mr. Schefer. On the walls of our room in Baker Library hangs a beautiful water color sketch of the famous "White Train" of the New York & New England R. R., done by the same artist and is the subject of our frontispiece.

Our Society.

Many of our members having recently joined may be interested in a short sketch of the growth and development of the Society. In 1924 in the Boston Sunday Herald appeared an article written by Mr. Albert D. Barker, then a writer on the Herald staff, now Assistant Publicity Manager of the Boston & Maine R. R., describing the collection of Mr. Warren Jacobs, one of our Directors. Not long after the appearance of this article a letter was received by Mr. Jacobs from Mr. C. C. Eaton, Librarian of the Baker Library (then building) inviting him to call at Harvard. Later Mr. Eaton called at Mr. Jacobs' office and extended an invitation to display such material as he wished in the Baker Library upon its completion. In this interview Mr. Jacobs explained to Mr. Eaton about this Society. As the result, our Society was offered quarters in the new Baker Library and Mr. Eaton was elected a Director of the Society in November, 1925.

The above explains in brief our entry to the Baker Library. The formation of the Society itself may be of interest. As far back as 1910 there were scattered throughout the country many men who were interested in the collection of railroad photographs and data. Some were interested in photographs of the old time locomotives, others preferred only the modern and armed with their cameras took these photographs, but a few others set to work to acquire as their means and opportunities permitted data relating to the early railroads in the form of time tables, tickets, posters, notices, hat checks, etc. Most of these men exchanged prints with such of their acquaintances as were interested along this line. The Great War with its many activities put a ban on some of this work but after the war clouds had lifted and peace declared many of the collectors dug out their collections and resumed work. For some time the writer had had some very interesting letters from Mr. R. W. Carlson of Escanaba, Michigan, and in the spring of 1921 definite plans were made to start this Society on its career. Upon being acquainted with the plan, Messrs. Warren Jacobs and Arthur Curran entered enthusiastically and these three together with the writer were the originators or founders, whichever you wish.

In the spring of 1921 appeared our First Bulletin together

with the first By-Laws of the Society. These provided for three classes of members: Life Members whose payment of the Life membership fee took care of their membership for life, Honorary Members, whose annual fee took care of their dues and bulletins for the current year and Ordinary Membership, whose members submitted a monograph for publication in the bulletin. Some difficulty was encountered in filling the office of President. The other officers were Arthur Curran, Recording Secretary; R. W. Carlson, Corresponding Secretary; A. A. Loomis, Jr., Treasurer, the writer as Vice President and Warren Jacobs and C. B. Burr as Directors.

It was soon apparent that the clause in the By-Laws stating that Ordinary Members must submit a monograph must be changed and this requirement was dropped. Later, 1924, these two classes of members were abolished and the annual dues were made to include all bulletins issued during the current year. It was in 1921 however, that Mr. Curran withdrew his interest and support in the Society. He was succeeded by Mr. C. W. Phillips who fills this office to the present day. It was in 1921 that the writer was urged to take the presidency and this put some one definitely at its head. The year ended with fifty names on our membership rolls.

Since 1921 our growth has been steady. Activities in various directions have increased and our membership has grown. Reviewing our activities in that time shows in brief the following:

In 1922 the number of Directors was increased from nine to eleven. This included a new office, that of New England Vice President. Our first Representative, Mr. G. W. Bishop, Kenilworth, England, was also appointed. We closed the year with nearly one hundred members.

In 1923 the Society was incorporated in the State of Massachusetts. Two more Representatives were appointed, Mr. D. L. Joslyn for the Pacific Coast and Mr. Norman Thompson for Canada. The year closed with 111 members and a surplus in the treasury, the latter being a welcome change from the previous deficits.

Later years have seen further increases in our membership until at the close of 1927 we had 206 members. From 1921 to the present time we have issued two bulletins each year, three were issued during 1927. The Committee on Publications has

been increased so as to include chairmen of the various sections, they selecting their own members to serve on their own committee. This is hoped will bring about an increase in the number and variety of contributions.

Turning now to the Baker Library, on June 4th, 1927, when that building was formally dedicated, there were on the walls in Mr. Eaton's office forty framed pictures. These included rare and old time tables of roads out of Boston from Warren Jacobs, and a set of the various railroad stations in Boston, from the writer.

It was the original intention to have the quarters of this Society in a small room next the Aldrich Memorial Library. Mr. Eaton quickly realized this room was inadequate for our purposes and on November 1st, 1927 assigned us two large rooms Nos. 423-424, on the fourth floor, with plenty of wall space for some time to come.

The Society formally took possession of these rooms on Nov. 6, 1927. Vice President Merrill arrived at the Baker Library at 10:00 A. M. on the morning of that day with 67 framed pictures ready to go on the walls. Other members of the committee, Messrs. Fogg, Jacobs and the writer, assisted in the work. Work of hanging the pictures in Room 423 was completed on the evening of November 9th. In the meantime the pictures in Mr. Eaton's office had been transferred to the new quarters and on January 1st, 1928 there was a total of 209 pictures on the walls of both rooms.

Material has steadily come in and today we have a large amount of material on exhibition. With the purpose of having the best exhibit of railroad material in America at Harvard University, this is now one of the aims of this Society of which you are a member. Many visitors have been welcomed in our rooms and we want our members to feel free to come whenever they can. There is a wonderful field here and thanks to the kindness of the Harvard authorities Our Society now has a home and chance to show our members and visitors an exhibit of which we can well be proud.

CHARLES E. FISHER.

Historical Notes on Locomotive Design, 1769-1840.

By E. G. Young.

For all practical purposes the history of the locomotive as such begins with the beginning of the nineteenth century, though in the years previous to 1800 there had been some notable experimenting. In 1769 Nicholas Cugnot had terrified his fellow Parisians with a three-wheeled monster propelled by steam; again, between 1780 and 1786 William Murdoch in England built some small model "steam carriages" which he ran successfully. Soon after 1800 Richard Trevethick, a Cornishman, built a model which propelled itself around his kitchen table, and in the next year, (1801) he followed this with a full-sized engine—the first to run on rails (Fig. 1). This machine was characterized principally by a ten-foot fly-wheel designed to carry it past the dead centers, as it had only one cylinder. This cylinder was as long as the boiler and at least a fourth its diameter. Attached to the fly-wheel shaft was a gear which drove an idler, this in turn driving gears fastened rigidly to the driving-axles. The steam distribution was effected by a valve driven by an arm from the cross head striking tappets on the valve-stem. This valve stem could also be operated by hand, and if the steam had been shut off before the end of the stroke, allowing the fly-wheel energy and the expansion of the steam to carry the piston to the beginning of the next stroke, the engine might have been run a considerable distance without exhausting its steam pressure. There is, however, no evidence that this method of using the steam expansively was discovered or used.

During the next few years, while there was much progress in the building of stationary engines and also in the construction and improvement of the tramway, there was little done along the line of locomotive building. In 1812 Murray, a colliery engineer (as indeed was nearly every one of these early locomotive pioneers) built an engine which was put into service with fair success at a Leeds colliery (Fig. 2). This was a rack driven machine, carried on four flanged wheels, between the left pair being placed the driver. This driving gear was made to revolve by the action of two vertical steam cylinders, driving a pair of spur gears under the engine frame, which in turn drove the shaft carrying the driving gear. The rack consisted of a series

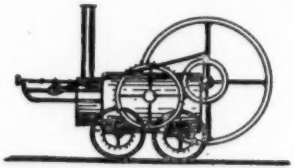

FIG. 1, TREVETHICK, 1801

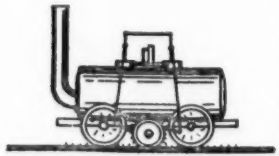

FIG. 2, MURRAY, 1812

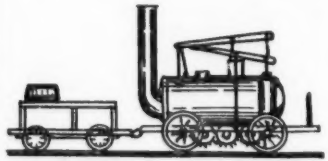

FIG. 3, PUFFING BILLY, 1813

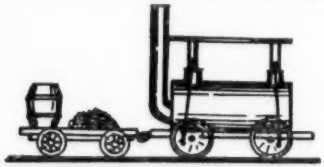

FIG. 4. BLUCHER, 1814.

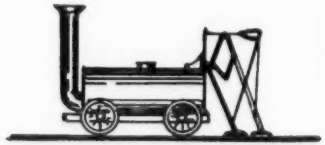

FIG. 5, BRUNTON, 1813

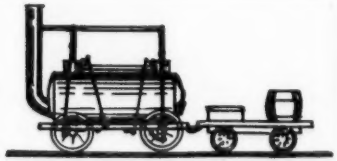

FIG. 6, STEPHENSON, 1825

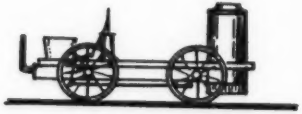

FIG. 7, ERICSSON, 1829

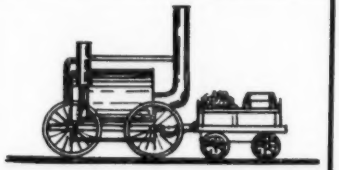

FIG. 8, HACKWORTH, 1829

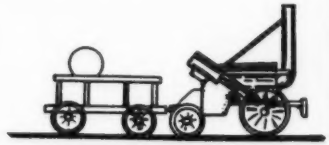

FIG. 9, STEPHENSON'S ROCKET, 1829

of pegs which protruded outward from the rail; the chief trouble with the engine was that there was only the rack on one side of the track, and machine did not keep the rails well, and also many gears and shafts were broken due to its "one-sidedness". Nevertheless, the success attained with this engine was sufficient to warrant the building of at least three more, all of which saw many years of actual service.

The following year—1813—is a great date in locomotive history, for in this year, Hedley, engineer of the Wylam collieries, substituted his engine "Puffing Billy" for horse power on the collier's tramways (Fig. 3). The transportation question at this colliery was of particular importance, and its progressive owners had tried the locomotive as far back as 1805, when Trevethick had built an engine for them, much after the pattern of his first locomotive. This machine was unsuccessful, mainly on account of having too much weight for the light rails in use. The "Puffing Billy" marked a bold departure on the part of its designer—the departure from the rack-driving plan that had been followed by most of the previous experimenters. Hedley had discovered by the aid of crude but ingenious experimental apparatus that there was sufficient adhesion between a smooth rail and a smooth wheel to give enough "grip" to an engine to permit it to draw a train behind it. "Puffing Billy" was driven by two vertical steam-jacketed cylinders. Through levers these drove a crank shaft midway between the driving axles and connected to them by gears.

In 1814, George Stephenson (a native of Wylam, who had had his first mechanical instruction in the collieries there and who was at this time as engine-wright in their service) produced his first engine. This was the "Blucher," (Fig. 4) characterized by vertical cylinders driging the wheels through connecting rods and cranks. This engine was quite successful in the colliery service. In 1815, Hedley built a second and more powerful engine on the same principles as marked "Puffing Billy." His two engines did faithful service for fifty years, when they were assigned honorable places in museums, though still in good working order. The next year we have another locomotive built by Stephenson, similar in general appearance to the "Blucher", but embodying a tremendous structural advance—the employment of the heretofore objectionable steam blast for the useful purpose of creating draught for the fires. This was ac-

complished by turning the exhaust steam into the chimney. "The Killingsworth No. 2" had also another notable improvement—the driving wheels were coupled by rods. In 1816, in partnership with a Newcastle founder (whom he afterward bought out) Stephenson built his third engine, characterized by minor improvements, and also by the attempt to use a cushion of steam under pressure as a spring to take up jars caused by the rough road bed.

In passing, perhaps the queerest of all locomotive freaks should be mentioned. This was the engine built by Brunton in 1813, which pushed itself along the track by means of a pair of feet behind. It was soon abandoned as a failure (Fig. 5).

Following 1815 there seems to be another interim of some years when no great progress was made in design, and probably very few, if any, engines were built. In the twenties the familiar tramway began to loom as a means of passenger transport, and again the question of motive power came up. This need seemed to revive experimenting on the part of Stephenson, Hackworth, and others. The building of the Stockton & Darlington railway began in 1824, with Stephenson as chief engineer. This road was designed for horse drawn vehicles, but he prevailed on the directors to allow him to build some experimental locomotives for the road. At the formal opening, in 1825, his engine "Locomotion No. 1" exceeded all expectations by drawing a train of thirty-eight vehicles at 12 miles per hour (Fig. 6). Four more engines were put into service at the same time; Timothy Hackworth was appointed locomotive superintendent, and he began building as well as repairing engines. His first notable work was the construction of an unsatisfactory engine of the first lot delivered. (This was the only one of the five first engines not built by Stephenson). As rebuilt, this engine was the first to have six drivers and a valve motion driven by an eccentric. The same year, Stephenson produced also a six-driver engine with improvements in the arrangement of the cylinders, guide bars, etc. In 1827 Hackworth also built his "Globe," not unlike the other former engines in mechanism, but surmounted by a large copper steam-dome, an innovation. This machine attained a speed of fifty miles an hour on the Stockton & Darlington after the road had been improved. Hackworth in the following years superintended the construction of numerous engines for this road, but his output never caught up with the demands of

Fig. 10, Seguin, 1827

Fig. 11, Stevens, 1825

Fig. 12, Stourbridge Lion, 1829

Fig. 13, Best Friend, 1831.

Fig. 14, West Point, 1831

Fig. 15, Herald, 1831.

the increasing traffic. Many of his engines following the reconstructed "Royal George" referred to, had six drivers.

The building of the Liverpool and Manchester Railway raised anew the quest for satisfactory motive power. Stationary engines for hauling the cars by means of cables had many partisans; horse and mule-power more still; on the side of the locomotive were a very small minority. But Stephenson was one of this minority, and since one of his engines had been doing good work in the construction of the line, he was able to prevail on the directors to give the locomotive a fair trial. Stephenson was at this time the Chief Engineer, as he had been of the Stockton & Darlington a few years before. The directors of the new road finally authorized a test or contest, open to all engine builders, offering a prize for the best machine and laying down certain conditions which the engine must fulfill. The momentous "Rainhill Contest" took place in October, 1829, with four contestants: Stephenson's "Rocket", Hackworth's "Sansspariel", Ericsson's "Novelty," and Burstall's "Perseverance". The latter was soon proved a failure and withdrawn (Figs. 7, 8, 9).

The "Novelty" had a combined vertical and horizontal boiler, the gases passing three times through the water space. A vertical cylinder drove the wheels through a bell crank with a rod to an inside cranked axle. The "Sansspariel" had two vertical cylinders acting on outside cranks on the rear drivers. The front and rear drivers were coupled with rods, and the boiler was equipped with a return flue. Neither the "Novelty" nor the "Sansspariel" was able to fulfill the conditions of the contest, though the latter gave an excellent account of itself, considering that the boiler had to supply steam to a badly cracked cylinder.

The "Rocket" completed the trials with the greatest ease, and was not delayed for repairs in any way. This very remarkable engine embodied two of the most essential principals used in locomotive building today: the steam blast previously referred to and the multitubular boiler. This improvement was suggested to Stephenson by Mr. Booth, an official of the road.* With the success of the Rocket, the place of the locomotive was secure, and all works capable of building engines were taxed to their utmost to supply the increasing demand.

*There is much controversy as to the origin of both of these important improvements. The statements made seem warranted by the best authorities.

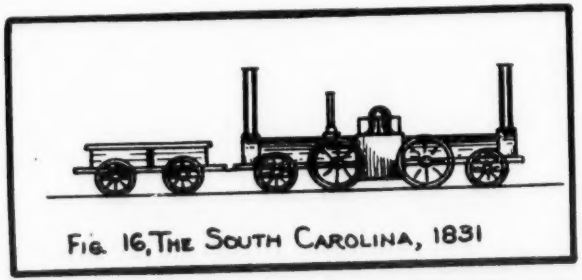

Fig. 16, The South Carolina, 1831

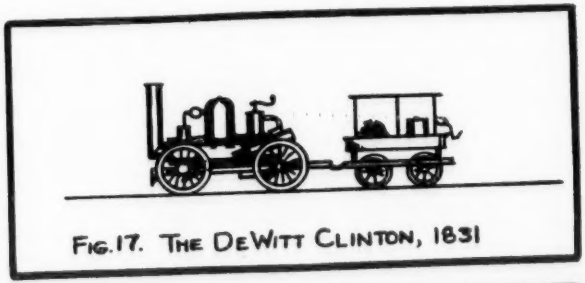

Fig. 17. The DeWitt Clinton, 1831

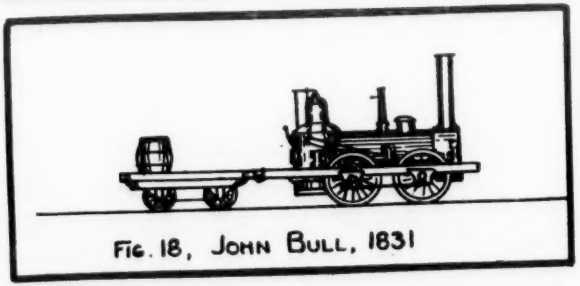

Fig. 18, John Bull, 1831

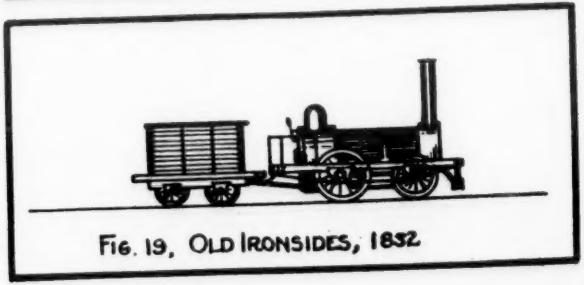

Fig. 19, Old Ironsides, 1832

Through the years 1826-29 another series of notable experiments were in progress across the Channel. M. Seguin in 1827 produced a successful engine for his road, the Lyons & St. Etienne. This engine was not unlike some of the English prototypes in mechanism, but Seguin provided forced draught for his fire by belting a fan to one of the tender axles (Fig. 10).

Locomotive history in the United States begins in 1825, when John Stevens of Hoboken, built a model railway in his back yard, and built a small locomotive to run on it (Fig. 11). This engine had a vertical boiler and a single cylinder acting on the driving axle through gearing.

About 1828, Horatio Allen, an engineer of the Delaware & Hudson Canal Company, hearing of the performance of the Stephenson engines in England, became impressed with the advantages of steam propulsion, and was finally sent to England to investigate and to purchase four engines for the company if he found them to be as reported. The engines were bought and arrived in this country during 1829. All were blocked up from the ground and tested on arrival, and then all but one were stored in New York.* One was taken by canal to Honesdale and given a trial, and so the "Stourbridge Lion" was the first locomotive on a real railway in America; though it never went beyond its trial, being too heavy for the construction of the road (Fig. 12).

When, in the late twenties, the Charleston & Hamburg Railroad of South Carolina was under construction, the builders definitely committed themselves to the use of steam power, and the first engines were ordered before the road was opened. In 1830-31 the West Point Foundry Company of New York built for this company two engines—the "Best Friend" and the "West Point"; the former pulled the first scheduled steam passenger train in America January 15, 1831. The defects of the "Best Friend" were remedied in the "West Point"; the use of a horizontal boiler in place of the vertical one being the most striking change (Figs. 13, 14).

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*What became of these three engines? This is an unsolved mystery.

'There seems to be a divergence of opinion as to the arrangement of the boiler in the "Best Friend." It is pictured and described both with the boiler between the wheels, and also overhanding, as shown. It is very probable that both are correct, and that sometime during the course of its service it was rebuilt. If this supposition be correct, the form with the boiler in the center is probably the later.

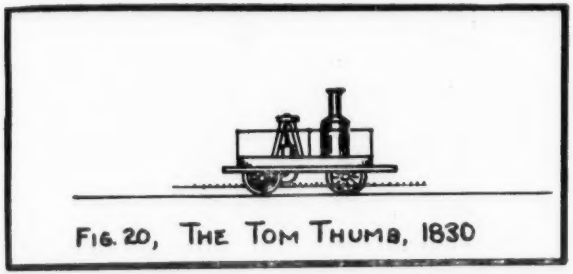


FIG. 20, THE TOM THUMB, 1830

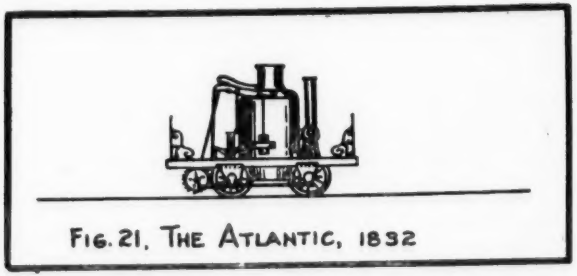


FIG. 21. THE ATLANTIC, 1832

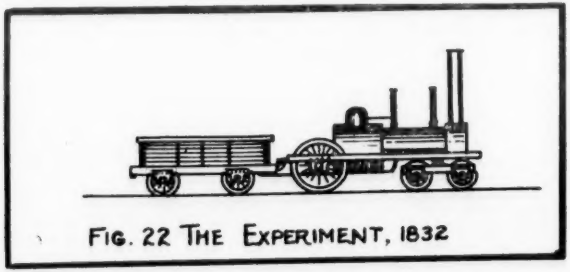


FIG. 22 THE EXPERIMENT, 1832

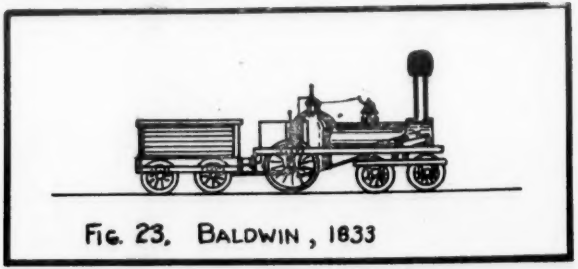


FIG. 23, BALDWIN, 1833

In 1831 we find steam power adopted on three important roads. The engine "Herald" was imported for use on the Baltimore & Susquehanna, (Fig. 15) and the "John Bull" (Fig. 18) for the Camden & Amboy (now part of the Pennsylvania). These engines were similar, having horizontal boilers, inside cylinders and four coupled drivers. The "John Bull" had the dome-topped firebox, and was later equipped with an awkward pilot carried by a pair of small wheels, and a box-like cab. The third road of the trio mentioned was the Albany & Schenectady, now part of the New York Central. The West Point Foundry built its third locomotive for this road in 1831, the "DeWitt Clinton" (Fig. 17). This was also a four driver engine, with inclined cylinders at the back of the fire-box. The "South Carolina" was also built at West Point in 1831—probably the first of the attempts to build a satisfactory "double-ender." It was in reality only two engines with a common fire-box in the center. There seems to be no record of the performance of this engine.

The year 1832 is significant in locomotive history for several reasons. In that year Matthias Baldwin established his little plant in Philadelphia, and turned out his first engine, "Old Ironsides," for the Philadelphia, Germantown & Norristown Railroad (Fig. 19). This was a two-driver engine with horizontal inside cylinders placed under the smokebox. After some years of experimenting, inaugurated with Cooper's diminutive "Tom Thumb" in 1830 (Fig. 20), the Baltimore & Ohio adopted steam power, their first engine in regular service being the "Atlantic" (Fig. 21). Also this year Jervis, of the Delaware & Hudson Company, introduced his swiveling truck and had built the "Experiment" (Fig. 22). This type of truck made the engine much safer on curves and light track. Winans of the Baltimore & Ohio, and Allen of the Charleston & Hamburg, seem to have conceived the idea almost simultaneously, but the patent belongs to Jervis. The "Experiment" had its cylinders placed as did "Old Ironsides," horizontally under the smokebox. The second Baldwin engine (Fig. 23) was built in 1833. This resembled the "Experiment" to some extent, but it had outside cylinders. However, Baldwin adhered to the cranked axle, and had his connecting rod inside of the frames.

Since locomotive building began in England, it is natural that American designers and builders should have been influenced to some extent by the English designs. This was true at

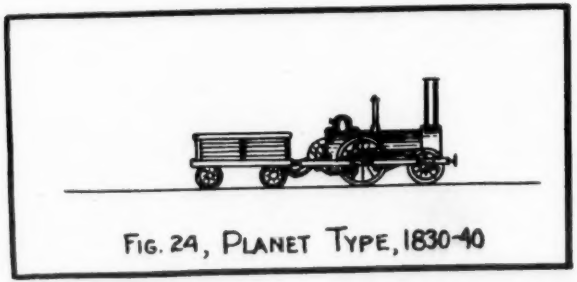


FIG. 24, PLANET TYPE, 1830-40

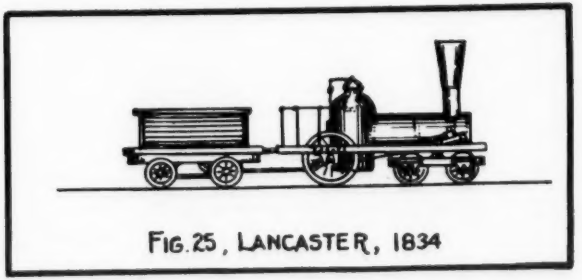


FIG. 25, LANCASTER, 1834

FIG. 26, THE WASHINGTON, 1835

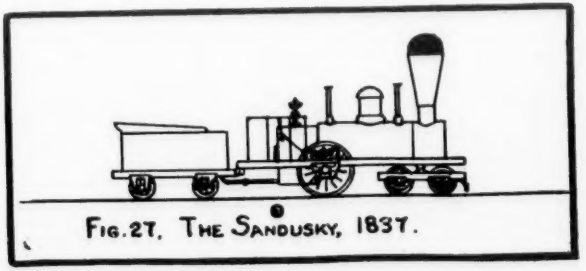


FIG. 27, THE SANDUSKY, 1837.

first, but the departure to original lines was rapid, and soon so good an engine was developed that we find a few being exported to Europe. Of course this trade went both ways; between 1829 and 1838 there seems to have been about forty English engines brought to this country. Most of these were made by the Stephensons at Newcastle, and the later ones, brought after 1834, were all of the "Planet" class (Fig. 24). This is the type which succeeded the "Rocket," and the only one the Stephenson works built for some time. But the adaptability of the swivel-truck to American track conditions soon gave it a place to the practical exclusion of other types.

Along with the heavier engines being built came a new problem: that of weight distribution. In 1834 the "Lancaster" (Fig. 25) was put into service on the Pennsylvania State Railroad, now part of the Pennsylvania System; this engine, with Baldwin's engine in 1833, is representative of the type having the fire-box ahead of the driving axle. These had too little weight on the drivers and were, therefore, lacking in adhesion. The "Washington," built by Norris in 1835 (Fig. 26), and the "Sandusky"* built by Rogers in 1837 (Fig. 27), typify those with the firebox behind the driving axle. These engines had too much weight on the driving axles. Rogers built the "Batavia" in 1838 (Fig. 28) with the firebox in front, and an arrangement for throwing some of the weight of the tender on the drivers, but this was only a make-shift solution. In the next decade another plan was adopted; in the "Stockbridge" (Rogers, 1842, Fig. 29), and the "Gov. Paine" (1848, Fig. 30), we have carrying-wheels used, with the drivers arranged as before, but these types seem to have gained no foothold, both being deficient in adhesion.

But long before the day of these last two engines, the need of improving the old type had gone. In 1836 Campbell patented the combination of a swiveling truck and four coupled drivers, and built an engine according to this plan (Fig. 31). While this was the first engine of this earliest modern type, it was very defective for the reason that there was not sufficient flexibility: it pounded both itself and the track to pieces. For this reason a share of the credit for the developing of the "American" type engine (as it soon came to be known) belongs to Eastwick and

*The "Sandusky" was the first engine to have a counterbalance in the driving wheels.

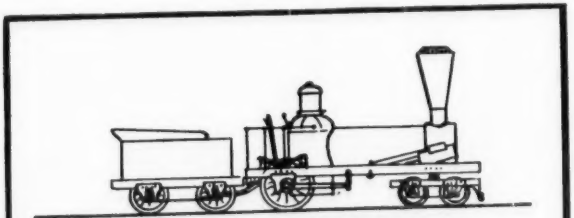


FIG. 28. THE BATAVIA, 1838

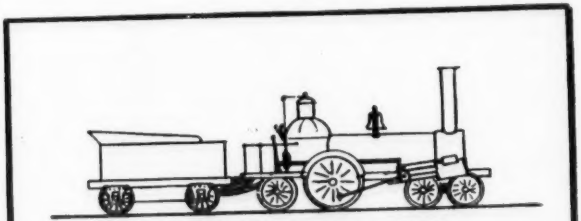


FIG. 29, THE STOCKBRIDGE, 1842.

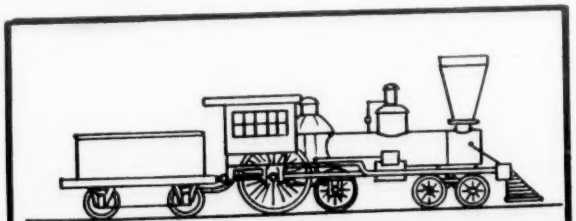


FIG. 30, GOV. PAINE, 1848

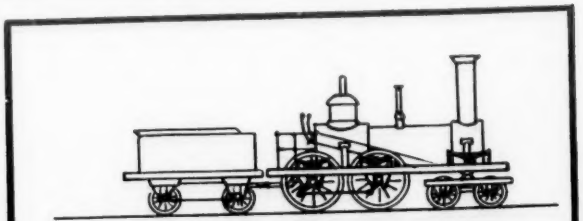


FIG. 31, CAMPBELL'S 8-WHEELER, 1836.

Harrison, who, in 1838, built a similar engine and fitted it with equalizing levers between the drivers and the truck (Fig. 32).

To sum up briefly the characteristics of the American engine of 1840:

It weighed from twelve to fifteen tons.

The multitubular boiler, with iron tubes, was universal.

The largest cylinders yet used had been 12x18″ and the highest working pressure ninety pounds per square inch.

The cylinders were in almost all cases outside of the frames, and they were generally inclined about eight to ten degrees.

The dome-top fire-box was almost universal, also the high, straight stack, and the swiveling truck.

Valve gears were rudimentary, the most advanced being the independent cut-off valve and gear, first used about 1839.

The tendency was toward inside frames.

The following are some of the construction features which had been definitely abandoned:

Vertical boilers.

Vertical and very steeply inclined cylinders.

Clyinders inclosed in the smoke-box.

The cranked and half-cranked axle.

The "grasshopper-beam" transmission, as used in Fig. 21.

[Editor's Note:—This is the first of a series of three articles on this subject, written and illustrated by Mr. Young. The other two will appear in succeeding issues.]

The Cleveland, Columbus, Cincinnati & Indianapolis Railroad.

By R. C. Schmid.

The Cleveland, Columbus, Cincinnati & Indianapolis Railroad, which was the principal parent line of the present Cleveland, Cincinnati, Chicago & St. Louis Railway, or "Big Four System" of the New York Central Lines, came into existence on May 16, 1868, as the result of a consolidation of the Cleveland, Columbus & Cincinnati Railroad Company and the Bellefontaine Railway Company. During its rather brief span of life (21 years), terminating in 1889, with the formation of the "Big Four" (through further consolidations), the C. C. C. & I. became a well organized and prosperous road. Traversing a comparatively level portion of the States of Ohio and Indiana, heavy grades and curves were few. Having but eighty-three locomotives at its inception, it was operating, in 1889, a total of two hundred twenty-four, of which forty-seven were on the Indianapolis & St. Louis line and sixteen on the Cincinnati & Springfield line (these lines having previously passed under the control of the C. C. C. & I.).

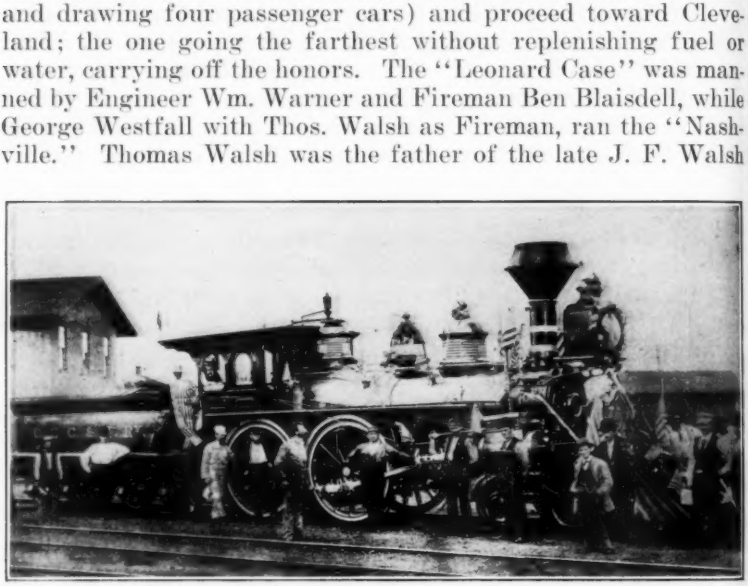
THE CLEVELAND, COLUMBUS & CINCINNATI RAILROAD.

The first of the C. C. C. & I. road's predecessors to be built was the Cleveland, Columbus & Cincinnati, which was chartered March 12, 1845, was completed in 1851, and the first train run through from Cleveland to Columbus, Ohio, on February 22nd of that year. The track gauge was 4 ft. 10 in., the standard for Ohio at that time.

The first locomotives on the road came from the shop of the Cuyahoga Steam Furnace Company at Cleveland, which firm continued to supply the majority of the locomotive equipment until 1857. There were also a Lowell, a Rogers, and a few Hinkleys at first, but the Cuyahogas were easily the favorites with the men. Later, however, some Taunton engines were purchased and these too came to have their advocates. The rivalry between the champions of the products of these two builders

became quite keen, and it was finally decided to settle the matter, once and for all, by an actual trial.

Permission having previously been granted by the Master Mechanic, the Cuyahoga engine "Nashville" and the Taunton engine "Leonard Case" were selected for the test. It was proposed that each engine start out, from Columbus, on an equal basis (that is, with a full and equal amount of wood and water and drawing four passenger cars) and proceed toward Cleveland; the one going the farthest without replenishing fuel or water, carrying off the honors. The "Leonard Case" was manned by Engineer Wm. Warner and Fireman Ben Blaisdell, while George Westfall with Thos. Walsh as Fireman, ran the "Nashville." Thomas Walsh was the father of the late J. F. Walsh



C. C. C. & I. Ry. #4, Old "Galion", Taunton on July 4, 1876.

who was Supt. of Motive Power of the Chesapeake & Ohio. The Taunton engine, it is said, barely crawled into Cleveland with every bit of wood and water gone, and with very little steam left. The "Nashville" was following some distance behind and when she failed to put in an appearance in a reasonable length of time, some anxiety began to be felt by the Cuyahoga "boys", but in due time, she came bowling into the station, but her Engineer, not content with stopping there, signaled to open the switch leading to the C. P. & A. tracks, and on he went, not stopping until Painesville had been reached, thirty miles away. The Cleveland, Painesville & Ashtabula Road (later L. S. & M. S.)

was at that time being operated jointly with the C. C. & C. and some of the trains regularly ran through between Columbus, Ohio, and Erie, Pa. The Cuyahoga Company presented Engineer Westfall with a gold watch and Fireman Walsh with a silver one.

The "Nashville" was also the engine selected in 1865 to haul President Lincoln's funeral train from Cleveland to Springfield, Ill. (the writer doubts if the same engine ran all of the way through). It is here shown, draped for the occasion. The "Leonard Case" lasted a long time, speaking well, in the end, for her eastern builders, and as C. C. C. & I. No. 142, is shown still in service in 1888. This photograph, taken in Indianapolis, shows the present Union Station, then nearing completion, in the background.

The "Louisville" was another famous Cuyahoga engine, but differed from the "Nashville" by being inside connected and having cylinders one inch smaller in diameter. She was run for many years by Engineer Horton (Pap) Loomis. In 1859, the "Louisville" was rebuilt and the steam chests moved from the inside of the smokebox and set at an inclined position on the outside to make them more easily accessible and to get the valves away from the hot cinders. She was in a serious wreck in 1864 and again rebuilt. A fine photograph of the "Louisville" was taken in the 60's, but the writer has thus far been unable to obtain a copy.

A small inside connected 0-4-0 switching locomotive was received from the Cuyahoga Works in 1853, called the "Myron Dow," being named for a man who had previously done the switching at Cleveland with a horse. The name was later changed to "Pony No. 1."

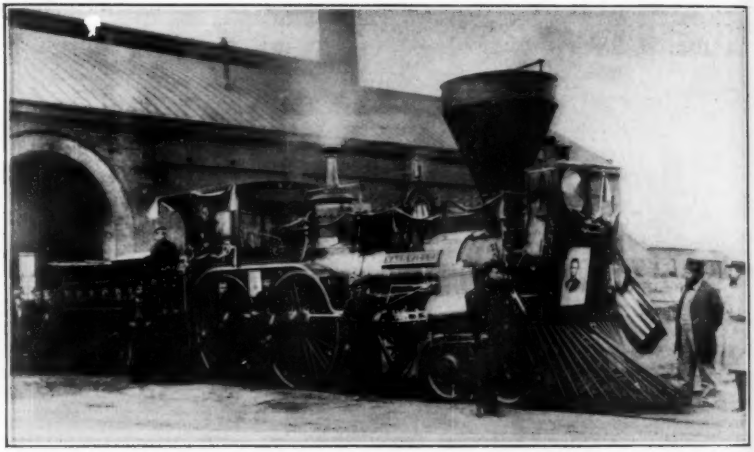
In 1861, the C. C. & C. acquired that part of the Springfield, Mt. Vernon & Pittsburgh Railroad between Delaware and Springfield, Ohio, (50 miles) and, with it, five engines. No data as to the builders of these engines has been found. This line afforded the C. C. & C. an entrance into Springfield, Ohio.

The United States Government requisitioned a locomotive from the C. C. & C. in 1862 and a Niles ten-wheeler, which is believed to have been the "Iowa", was sold them. Another locomotive, presumably the "Franklin", a Cuyahoga, was taken by the Government in October, 1863.

At the time of the consolidation in 1868, the C. C. & C. had forty-seven locomotives consisting of the named engines in the accompanying engine list, beginning with the "Columbus" and ending with the "Wyoming" (No. 145). The numbers were adopted in 1871, at which time the names were dropped. The C. C. & C. engines were numbered from 101 upward in the C. C. C. & I. list.

Other engines which did service on the road, but disappeared prior to 1868, were as follows:

Mt. Vernon—Lowell Mach. Shop, 1850, 4-4-0, 14″x18″ Cylinders, 60″ drivers.



C. C. & C. R. R. "Nashville," Cuyahoga 1852.
Photo.—Courtesy of A. A. Loomis, Jr.

Springfield—Hinkley, 1845, 4-4-0, 13½″x20″ Cylinders, outside conn. 60″ drivers; sold 1856.
Washington—Hinkley, 1846, 4-4-0, 13½″x20″ Cylinders, outside conn. 60″ drivers, sold 1855.
Eclipse—Springfield Car & Eng. Co., 4-4-0, 14″x20″ Cylinders, 66″ drivers.

The above engines were bought second hand, presumably from the Western Railroad (Mass.).

Little Xenia—Rogers, 1844, 4-4-0, 12″x18″ Cylinders, 54″ drivers—Second hand from Little Miami Railroad—Sold about 1863.
Xenia—Hinkley, August, 1851, 4-4-0, 16″x20″ Cylinders, 54″ drivers—Second hand from Columbus & Xenia Road. Probably sold to the C. P. & A. R. R.

Belle Centre—A. Harkness, 4-4-0, 12″x18″ Cylinders, 62″ drivers—Bought second hand.
Cleveland—Cuyahoga, March, 1850, 4-4-0, 14″x20″ Cylinders, 66″ drivers, inside conn.
Franklin—Cuyahoga, April, 1851, 4-4-0, 16″x20″ Cylinders, 54″ drivers, outside conn. (Probably the engine sold to the U. S. Government in 1863.)
Iowa—Niles & Co., April, 1853, 4-6-0, 16″x22″ Cylinders, 48″ drivers, ten-wheeler. Sold to Government in 1862.

The following locomotives were jointly operated by the C. C. & C. and Cleveland, Painesville & Ashtabula roads for a time, but in 1855 were turned over to the latter road. The Fifth Annual Report of the C. C. & C., made January 1, 1856, is the first one not listing the C. P. & A. engines, nor does any mention of them appear thereafter. They were all eight-wheel, 4-4-0 engines:

Lion—Schenectady, July, 1852, 16″x22″ Cyl., 60″ drivers.
Leopard—Schenectady, Sept., 1852, 16″x22″ Cyl., 60″ drivers.
Eagle—Cuyahoga, Sept., 1852, 15″x20″ Cyl., 72″ drivers.
Falcon—Cuyahoga, Oct., 1852, 15″x20″ Cyl., 72″ drivers.
Illinois—Souther, 1852, 15″x20″ Cyl., 54″ drivers.
Kentucky—Souther, 1852, 15″x20″ Cyl., 54″ drivers.
Ospray—Cuyahoga, Dec., 1852, 15″x20″ Cyl., 72″ drivers.
Tiger—Schenectady, Feb., 1853, 16″x22″ Cyl., 66″ drivers.
Panther—Schenectady, Feb., 1853, 16″x22″ Cyl., 66″ drivers.
Lynx—Schenectady, Mar., 1853, 16″x22″ Cyl., 66″ drivers.
Painesville—Taunton, Aug., 1853, 15″x22″ Cyl., 60″ drivers.
Ashtabula—Taunton, Aug., 1853, 15″x22″ Cyl., 60″ drivers.
Alfred Kelley—Taunton, Dec., 1853, 15″x22″ Cyl., 72″ drivers.
Conneaut—Taunton, Dec., 1853, 15″x22″ Cyl., 72″ drivers.
Kingville—Souther, 1854, 15″x20″ Cyl., 66″ drivers.
Massachusetts—Cuyahoga, Mar., 1854, 16″x20″ Cyl., 60″ drivers.
R. Hilliard—Taunton, Apr., 1854, 15″x22″ Cyl., 72″ drivers.
Vermont—Cuyahoga, May, 1854, 16″x20″ Cyl., 60″ drivers.
Rhode Island—Cuyahoga, June, 1854, 16″x20″ Cyl., 60″ drivers.
Virginia—Cuyahoga, Apr., 1854, 16″x20″ Cyl., 60″ drivers.

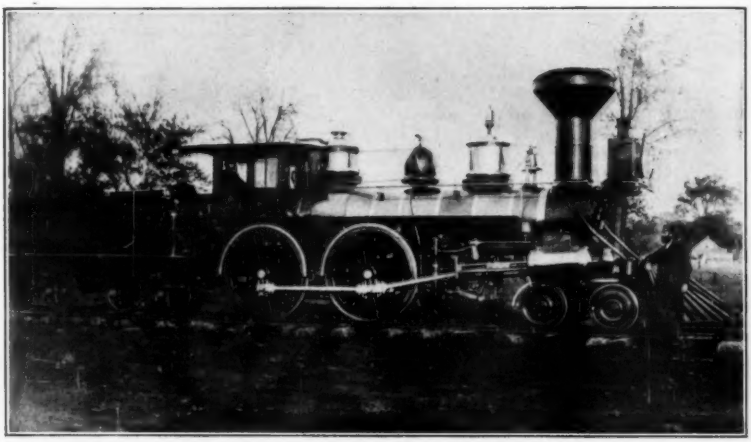
THE BELLEFONTAINE RAILWAY COMPANY.

The stretch of railroad between Galion, Ohio, and Indianapolis, Indiana, was known in the early 1860's as the Bellefontaine Railroad Line, and profusely worded hand bills advertised it as the "Shortest line between Pittsburgh and the West". Connection from Pittsburgh was had over the Pittsburgh, Ft. Wayne & Chicago road at Crestline, Ohio, four miles northeast of Galion on the C. C. & C. road. A four mile connecting track was laid between Galion and Crestline to handle this connection. It is a singular fact that these two roads which went to form a through line to the Great West in those days now separately

form portions of the two largest competitors for western business—the P. Ft. W. & C. of the Pennsylvania Lines and the Bellefontaine Railroad of the New York Central Lines.

The name Bellefontaine R. R. Line was shortened by employees and others to "B. Line" or "Bee Line", partly due also to its directness between Indianapolis and Galion, and to this day, railroad men refer to this division as the "Bee Line."

A road called the Indianapolis and Bellefontaine, the first link of the "Bee Line", which I will take up, was chartered February 17, 1848, to build a line from Indianapolis, northeast to the State line between Indiana and Ohio. Track laying began at

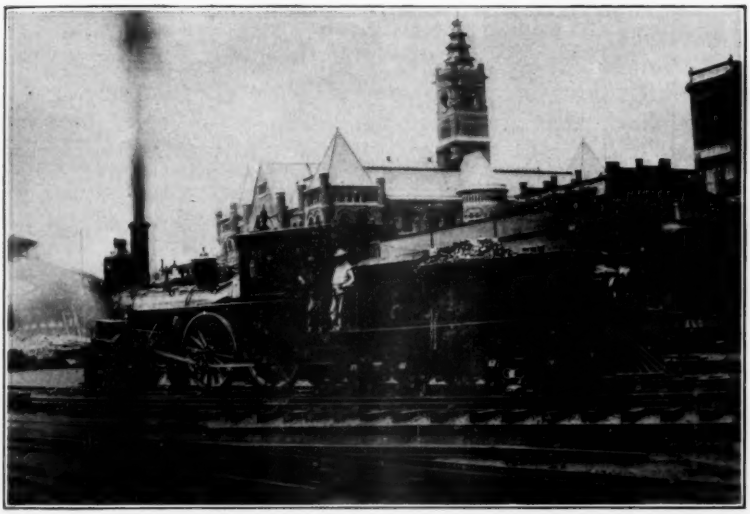


C. C. C. & I. Ry. No. 20.
Photo.—Courtesy of A. A. Loomis, Jr.

Indianapolis in 1850. At the same time, a road called the Greenville and Miami, was building from Dayton, Ohio, to a junction with the projected I. & B. at the Indiana-Ohio State line. Quite a rivalry arose between the two roads to see which would be first to reach the State line. The Ohio road won, finishing with their tracks about a foot on Indiana soil on Christmas Day, 1852. The I. & B. completed their track laying a few days later. Here a town (part of which lies in Ohio and part in Indiana), appropriately called Union City, sprang up almost immediately after the completion of these two roads. In January, 1853, "through"

service was established between Indianapolis and Dayton. It could hardly have been "through" service in the strict sense of the word, as a change of cars was undoubtedly necessary at Union City due to the variation of guages. The track gauge of Ohio was, at that time, fixed by law at 4 ft. 10 in., while that of the I. & B. was 4 ft. 8½ in.

A little later, a third line entered Union City from the East. This was the Bellefontaine & Indiana road (from Galion, Ohio), of which I will treat a little later on. The Greenville & Miami



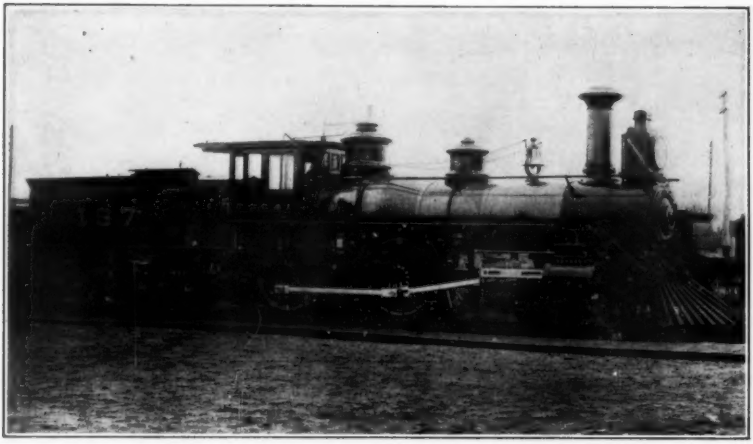
C. C. C. & I. Ry. #142, Old Taunton Rebuilt, at Indianapolis, Ind.
Photo.—Courtesy of F. S. Wyman.

became an independent line, later called the Dayton & Union and is now controlled by the B. & O.

As the I. & B. did not receive any locomotives (with the exception of a small Hinkley four-wheeler built in 1851) until 1853, the construction and opening of the line had to be carried on with locomotives borrowed from the Madison & Indianapolis Railroad. The first locomotives the road owned (besides the one mentioned) came from M. W. Baldwin and from the Amoskeag Works. Several Cuyahoga engines also appeared in 1853. A

Taunton engine, named the "Kilgore", afterwards the "California", was obtained from the Greenville & Miami road. The name of the Indianapolis & Bellefontaine was changed on February 1, 1855, to the Indianapolis, Pittsburgh & Cleveland.

On February 25, 1848, the Bellefontaine & Indiana received a charter to build a railroad from Galion, Ohio, on the C. C. & C. road, southwest to Union City where it would join the I. & B. line from Indianapolis. Work on the line did not commence until 1851, about a year later than on the I. & B. The road was completed late in 1853 (gauge 4 ft. 10 in.). Taunton and Cuyahoga engines, also a Hinkley four-wheel switching locomotive, and a Harkness engine called the "Washington", bought second hand from the Little Miami R. R. for use on construction trains, constituted the first motive power. The "Washington" disappeared from the engine lists after 1855. Two Niles engines, the "Sidney" and the "Kentucky", appeared late in 1853. The



C. C. C. & I. #167, Brooks 1886.

"Sidney", later No. 29, was rebuilt at the Galion Shop in 1856. The "Sidney" was a long lived engine. It became successively C. C. C. & I. Nos. 29 and 131 and C. C. C. & St. L. No. 144. It was still in service in the early 90's. As the No. 29, it is here shown in the Brightwood, Indiana, Yard some time in the 70's.

The following locomotives were sold to the U. S. Government in 1863:

"Bellefontaine"—Taunton, Jan., 1853, 4-4-0, inside connected, 14″x20″ Cylinders, 66″ drivers.
"Kentucky"—Niles, July, 1853, 4-4-0, outside connected, 15″x22″ Cylinders, 60″ drivers.

The "Kentucky" was evidently returned, as she again appears on the engine lists after 1865. One of the famous engines of the B. & I. was the "Galion", later No. 4, built by Taunton as an insider. It was rebuilt in 1871, with outside cylinders. The picture shows the No. 4 as it appeared on Centennial Day, July 4, 1876, gaily bedecked for its run on the Indianapolis passenger train that day.

The B. & I. and the I. P. & C. were consolidated, "pursuant to the laws of Indiana and Ohio", on December 20, 1864, as the Bellefontaine Railway Company, although a joint committee from both roads had operated them together for the previous eight years. The formation of the C. C. C. & I. in 1868 found the "Bee Line" in possession of thirty-six locomotives. These had both names and numbers (1 to 36). The same numbers were retained on the C. C. C. & I. list, and the names were dropped in 1869.

THE C. C. C. & I. RAILROAD.

Immediately after the consolidation, the C. C. C. & I. commenced building locomotives in its own shops at Cleveland and Galion. These were of the eight-wheel (4-4-0) and four-wheel (0-4-0) types. Engines of both types were also purchased from the Grant Locomotive Works in 1871. About this time, the air brake was adopted and the engines began to be equipped. The Company also started altering engines for coal burning, in the early 70's, wood having previously been used exclusively for fuel.

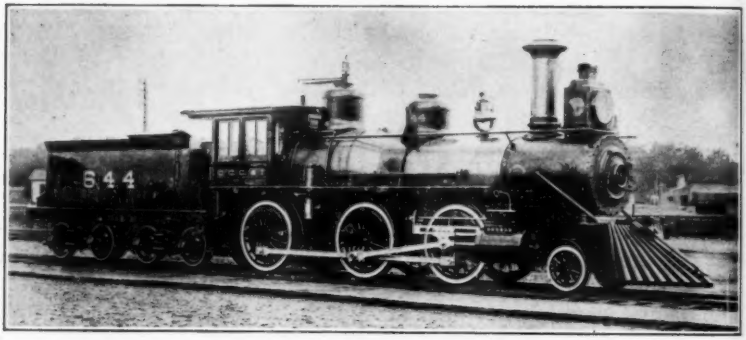
In 1871, the Cincinnati & Springfield Road was leased and an entrance into Cincinnati, Ohio, was thereby obtained. This line had sixteen locomotives, which were numbered from 201 to 216 in the C. C. C. & I. list.

The first Brooks engines, fifteen in number, were received in 1872. These were all 16″x24″, 4-4-0 engines, and were used in freight service, also occasionally in passenger service. These engines rendered excellent service, and for a good many years afterward the Brooks engines were the favorites.

The first Mogul (2-6-0) engines came from the Brooks Locomotive Works in 1879. These were followed by others built in the Company shops and a number from the Grant Works. The Mogul thereafter became the standard for heavy freight service, and remained so until about 1892.

On July 23, 1882, the Indianapolis & St. Louis Rwy. together with its rights as lessee of the St. Louis, Alton & Terre Haute was acquired by purchase at a judicial sale, thus affording the C. C. C. & I. a continuous line from Cleveland to St. Louis, a distance of 544 miles. The I. & St. L. Rwy. retained its identity, however, until 1889, and a detailed historical account of this line will not be here taken up.

In 1882, the locomotives of the C. C. C. & I., including also those of the Indianapolis & St. Louis and the Cincinnati &



C. C. C. & I. #644, Brooks 1887.

Springfield, were regrouped as regards service performed and renumbered. Switching locomotives were numbered below 100; passenger locomotives, 100 series; eight-wheel freight locomotives, 300 and 400 series; ten-wheel freight locomotives, 500 series; and Mogul freight locomotives, 600 series. The Moguls and ten-wheelers (the latter were all on I. & St. L.) were in 1887 renumbered to the 300 series.

On July 28, 1884, the boiler of engine 395 exploded. This engine was one which had been built by the company at Cleveland in October, 1869. It was so badly damaged by the explosion that it was immediately dismantled. The rupture, as shown

by a small tracing which the writer lately found in the Mechanical Department offices, occurred in the boiler barrel at the seond course.

The first Schenectady engines appeared in 1888 and 1889. These vied with the Brooks engines in giving a good account of themselves.

The following locomotives were built or purchased under the new numbering scheme between the years 1882 and 1889:

No. 44—Co. Shops, 1882, 0-6-0, 16″x22″, 50″ drivers, CCC&StL No. 44.
Nos. 616 to 625—Co. Shops, 1882, 2-6-0, 18″x24″, 56″ drivers, CCC&StL Nos. 316 to 325.
Nos. 626 to 639, Co. Shops, 1883, 2-6-0, 18″x24″, 56″ drivers, CCC&StL Nos. 326 to 339.
Nos. 640 to 642—Co. Shops, 1884, 2-6-0, 18″x24″, 56″ drivers, CCC&StL Nos. 340 to 342.
No. 643—Co. Shops, 1885, 2-6-0, 18″x24″, 56″ drivers, CCC&StL No. 343.
Nos. 165 to 168, Brooks, 1886, 4-4-0, 18″x24″, 68″ drivers, CCC&StL Nos. 122 to 125.
Nos. 644 to 649, later Nos. 348, 357, 382, 383, 389, & 392, Brooks, 1887, 2-6-0, 18″x24″, 56″ drivers, CCC&StL (Same Nos.)
Nos. 45-46, Brooks, 1887, 0-6-0, 18″x24″, 50″ drivers, CCC&StL Nos. 45-46.
Nos. 169-170, Brooks, 1887, 4-4-0, 18″x24″, 68″ drivers, CCC&StL Nos. 126-127.
Nos. 21 & 27—Schenectady, 1888, 0-6-0, 17″x24″, 50″ drivers, CCC&StL Nos. 21 & 27.
Nos. 141 & 142—Schenectady, 1889, 4-4-0, 18″x24″, 68″ drivers, CCC&StL Nos. 141-142.
Nos. 14, 30, & 32—Schenectady, 1889, 0-6-0, 17″x24″,50″ drivers, CCC&StL (Same Nos.).

The Cleveland, Cincinnati, Chicago & St. Louis Railway, or "Big Four System", was formed on July 1, 1889, by consolidation of the following roads, each contributing the number of locomotives shown:

Cleveland, Columbus, Cincinnati & Indianapolis Rwy.	161	locomotives
Indianapolis & St. Louis Railway	47	"
Cincinnati & Springfield Railway	16	"
Cincinnati, Indianapolis, St. Louis & Chicago Rwy.	75	"
Cairo, Vincennes & Chicago Railway	24	"
Total	323	"

By further consolidations, which took place in 1890, 1891, and 1920, the "Big Four" has been expanded to a system of 2,573 miles, operating 957 locomotives.

C. C. C. & I. RAILWAY—LIST OF LOCOMOTIVES—PRIOR TO 1882.

No.	Old Name	Former Road	Builder	Date Built	Cylinders	Connection	Diam. Drivers	Wheel Arr.	New No. in 1882
1	Pony Wn. Div.	I.P.& C.	Hinkley	7–1852	11″x20″	Outside	48″	0-4-0	Cut up—1878
2	Pony Eastern Div.	B.& I.	Hinkley	7–1851	12″x20″	Outside	48″	0-4-0	Cut up—1878
3	Ohio	B.& I.	Taunton	7–1852	14″x20″	Inside	54″	4-4-0	#125
4	Galion	B.& I.	Taunton	11–1852	14″x20″	Inside	66″	4-4-0	#126
5	Pennsylvania	B.& I.	Taunton	12–1852	14″x20″	Inside	54″	4-4-0	#127
6	Cleveland	B.& I.	Cuyahoga	1–1853	15″x20″	Outside	72″	4-4-0	#128
7	North Star (Form. St. Louis)	B.& I.	Cuyahoga	3–1853	15″x20″	Outside	72″	4-4-0	
8	Randolph (Form. Union)	I.P.& C.	Baldwin	4–1853	13½″x24″	Outside	54″	4-4-0	#345
9	Missouri	B.& I.	Cuyahoga	5–1853	16″x20″	Outside	54″	4-4-0	
10	Michigan	B.& I.	Cuyahoga	6–1853	16″x20″	Outside	54″	4-4-0	#346
11	Anderson	I.P.& C.	Baldwin	6–1853	13½″x24″	Outside	66″	4-4-0	#347
12	Illinois	B.& I.	Cuyahoga	4–1853	16″x20″	Outside	60″	4-4-0	
13	Marion	B.& I.	Taunton	6–1853	15⅝″x20″	Inside	72″	4-4-0	#129
14	Oregon	B.& I.	Cuyahoga	7–1853	16″x20″	Outside	54″	4-4-0	#348
15	Kentucky	B.& I.	Niles & Co.	7–1853	15″x22″	Outside	60″	4-4-0	Cut up—1879
16	Delaware (Form. Cleveland)	I.P.& C.	Amoskeag	6–1853	13½″x22″	Outside	60″	4-4-0	#349
17	Vermont	I.P.& C.	Cuyahoga	9–1853	16″x20″	Outside	60″	4-4-0	
18	Winchester (Form. O.H.Smith)	I.P.& C.	Baldwin	9–1853	13½″x24″	Outside	66″	4-4-0	#350
19	Wisconsin (Form. A.N.Morris)	I.P.& C.	Amoskeag	3–1853	13″x22″	Outside	66″	4-4-0	#130
20	Madison (Form. Harrison)	I.P.& C.	Cuyahoga	9–1853	16″x20″	Outside	60″	4-4-0	
21	Union	B.& I.	Cuyahoga	10–1853	15″x22″	Outside	72″	4-4-0	
22	Kansas (Form. Yandes)	I.P.& C.	New Jersey	4–1854	15″x20″	Outside	72″	4-4-0	#351
23	New York (Form. Indpls.)	B.& I.	Taunton	6–1854	15″x22″	Outside	60″	4-4-0	#352
24	Indiana	I.P.& C.	Cuyahoga	7–1854	16″x20″	Outside	60″	4-4-0	
25	Pittsburgh	I.P.& C.	Cuyahoga	9–1855	16″x22″	Outside	60″	4-4-0	
26	California (Form. Kilgore)	I.P.& C.	Taunton	1855	15″x22″	Outside	60″	4-4-0	#353
27	Indianapolis (Form. New York)	I.P.& C.	———	1853	16″x22″	Outside	60″	4-4-0	#354
28	New Jersey	B.& I.	Cuyahoga	12–1856	16″x22″	Outside	60″	4-4-0	
29	Sidney	B.& I.	Niles & Co.	7–1853	15¼″x22″	Outside	72″	4-4-0	#131
30	New Hampshire	Bellef't.	Rogers	2–1863	16″x24″	Outside	60″	4-4-0	#355
31	Iowa	Bellef't.	Rogers	4–1863	16″x24″	Outside	60″	4-4-0	#356
32	Maine	Bellef't.	Rogers	6–1863	16″x24″	Outside	60″	4-4-0	#357
33	Minnesota	Bellef't.	Rogers	8–1863	16″x24″	Outside	60″	4-4-0	#358
34	Massachusetts	Bellef't.	Rogers	7–1864	16″x24″	Outside	60″	4-4-0	#359
35	Connecticut	Bellef't.	Rogers	7–1864	16″x24″	Outside	60″	4-4-0	#360

No.	Old Name	Former Road	Builder	Date Built	Cylinders	Connection	Diam. Drivers	Wheel Arr.	New No. in 1882
36	Maryland	Bellef't.	Danf.-Cooke	11–1864	16″x24″	Outside	60″	4-4-0	#361
37			Galion Shop	1868		Outside		4-4-0	#362
38–40			Galion Shop	1869		Outside		4-4-0	#363 to 365
41–42			Galion Shop	1870		Outside		4-4-0	#366 to 367
43			Galion Shop	9–1871		Outside		4-4-0	#368
44			Grant	9–1871		Outside		4-4-0	——
45			Grant	9–1871		Outside		4-4-0	#132
46–47			Grant	9–1871	14″x22″	Outside	50″	0-4-0	#15 to 16
48			Galion Shop	1871		Outside		4-4-0	#369
49–52			Brooks	3–1872	16″x24″	Outside	60″	4-4-0	#370 to 373
53			Galion Shop	1872	16″x24″	Outside		4-4-0	#374
54			Galion Shop	1873	16″x24″	Outside		4-4-0	#133
55–59			Brooks	1872	16″x24″	Outside	60″	4-4-0	#375 to 379
60			C.C.C.& I.	1873	14″x22″	Outside	50″	0-4-0	#17
61–62			Grant	1873	16″x22″	Outside		4-4-0	#134 to 135
63–64			Grant	1873		Outside		4-4-0	#136 to 137
65–66			Grant	1873	16″x22″	Outside	62″	4-4-0	#380 to 381
67–68			C.C.C.& I.	1876	14″x22″	Outside	50″	0-4-0	#18 to 19
69–73			Brooks	12–1879	18″x24″	Outside	55¾″	2-6-0	#600 to 604
74			C.C.C.& I.	1880	18″x24″	Outside	56″	2-6-0	#605
75			C.C.C.& I.	1881	18″x24″	Outside	56″	2-6-0	#606
76–83			Grant	1881	18″x24″	Outside	56″	2-6-0	#607 to 614
84			C.C.C & I.	1881	18″x24″	Outside	56″	2-6-0	#615
100			C.C C & I.	11–1876	14″x22″	Outside	50″	0-4-0	#20
	Columbus	C C.& C	Cuyahoga	6–1850	14″x20″	Inside	66″	4-4-0	Cut up—1868
101	Cuyahoga	C.C.& C.	Cuyahoga	8–1850	16″x20″	Outside	54″	4-4-0	#382
102	Lorain	C C.& C	Cuyahoga	9–1850	16″x20″	Outside	54″	4-4-0	#383
103	Huron	C C.& C	Cuyahoga	11–1850	16″x20″	Outside	54″	4-4-0	#21
104	Richland	C C & C	Cuyahoga	1–1851	16″x20″	Outside	54″	4-4-0	#22
105	Delaware	C.C.& C	Cuyahoga	2–1851	16″x20″	Outside	54″	4-4-0	
106	Cincinnati	C.C & C	Cuyahoga	6–1851	14″x20″	Inside	66″	4-4-0	
107	St. Louis	C.C & C	Cuyahoga	7–1851	14″x20″	Inside	66″	4-4-0	#23
108	Louisville	C C & C	Cuyahoga	9–1851	14″x20″	Inside	66″	4-4-0	Cond. 1868
	New Orleans	C.C.& C.	Cuyahoga	12–1851	14″x20″	Inside	66″	4-4-0	Blr. used on Crawford
109	Ohio	C.C.& C.	Cuyahoga	12–1851	16″x20″	Outside	54″	4-4-0	#384

No.	Old Name	Former Road	Builder	Date Built	Cylinders	Connection	Diam. Drivers	Wheel Arr.	New No. in 1882
110	New York	C.C.& C.	Cuyahoga	1–1852	16″x20″	Outside	54″	4-4-0	#138
111	Indianapolis	C.C.& C.	Cuyahoga	4–1852	15″x20″	Outside	72″	4-4-0	#139
112	Chicago	C.C.& C.	Cuyahoga	5–1852	15″x20″	Outside	72″	4-4-0	#140
113	Nashville	C.C.& C.	Cuyahoga	6–1852	15″x20″	Outside	72″	4-4-0	#24
114	Indiana	C.C.& C.	Cuyahoga	8–1852	16″x20″	Outside	60″	4-4-0	
115	Erie	C.C.& C.	Souther	12–1852	15″x20″	Inside	66″	4-4-0	Cut up—1879
116	Buffalo	C.C.& C.	Souther	3–1853	15″x20″	Inside	66″	4-4-0	#141
117	Leonard Case	C.C.& C.	Taunton	10–1853	15″x22″	Outside	72″	4-4-0	#142
	Pony No. 1 (Form. Myron Dow)	C.C.& C.	Cuyahoga	12–1853	13″x20″	Inside	48″	0-4-0	Cut up 1879
118	Pony No. 2	C.C.& C.	Cuyahoga	11–1853	13″x20″	Inside	48″	0-4-0	Cut up 1871
119	Crawford	C.C.& C.	Cuyahoga	1–1854	16″x20″	Outside	60″	4-4-0	#385
120	Morrow	C.C.& C.	Cuyahoga	2–1854	16″x20″	Outside	60″	4-4-0	#26
121	J. M. Woolsey	C.C.& C.	Taunton	2–1854	15″x22″	Outside	72″	4-4-0	#143
122	Pony No. 4	C.C.& C.	Cuyahoga	3–1854	13″x20″	Inside	48″	0-4-0	#27
123	Maine	C.C.& C.	Cuyahoga	4–1854	16″x20″	Outside	60″	4-4-0	#386
124	New Hampshire	C.C.& C.	Cuyahoga	5–1854	16″x20″	Outside	60″	4-4-0	#28
125	Connecticut	C.C.& C.	Cuyahoga	8–1854	16″x20″	Outside	60″	4-4-0	#387
126	New Jersey	C.C.& C.	Cuyahoga	9–1854	16″x20″	Outside	60″	4-4-0	#29
127	Missouri	C.C.& C.	Cuyahoga	10–1854	16″x20″	Outside	60″	4-4-0	#388
128	Maryland	C.C.& C.	Cuyahoga	1–1855	16″x20″	Outside	60″	4-4-0	#389
129	Tennessee	C.C.& C.	Cuyahoga	1–1856	16″x20″	Outside	60″	4-4-0	#390
130	Louisiana	C.C.& C.	Cuyahoga	2–1856	16″x22″	Outside	66″	4-4-0	#144
131	Alabama	C.C.& C.	Cuyahoga	3–1856	16″x20″	Outside	60″	4-4-0	#391
132	California	C.C.& C.	Cuyahoga	6–1856	16″x20″	Outside	60″	4-4-0	#392
133	Pony No. 3	C.C.& C.	Cuyahoga	2–1854	13″x20″	Inside	48″	0-4-0	
134	Minnesota	C.C.& C.	*	1862		Outside			#30
135	Pennsylvania	C.C.& C.		2–1863	16″x22″	Outside	60″	4-4-0	#145
136	Kansas	C.C.& C.	Niles & Co.	5–1853	16″x22″	Outside	48″	4-6-0	Cut up—1878
137	Montana	C.C.& C.	Niles & Co.	5–1853	16″x22″	Outside	48″	4-6-0	Cut up—1878
138	Colorado	C.C.& C.		1863		Outside			#32
139	Idaho	C.C.& C.							#33
	Regulator	SMtV&P							
	Olentangy	SMtV&P							
140	Clark	SMtV&P							#34
141	Power	SMtV&P							#35
142	Goshen	C.C.& C.	Grant	1867	16″x22″	Outside	62″	4-4-0	#146

*Builder unknown on #134.

*Builder unknown on #134.

No.	Old Name	Former Road	Builder	Date Built	Cylinders	Connection	Diam. Drivers	Wheel Arr.	New No. in 1882
143	Union	C.C.& C.	Grant	1867	16"x22"	Outside	62"	4-4-0	#393
144	L. M. Hubby	C.C.& C.	Grant	1867	16"x22"	Outside	62"	4-4-0	#394
145	Wyoming		Cleve.Shop	1868		Outside		4-4-0	#147
146	Dakota		Cleve.Shop	1869		Outside		4-4-0	#148
147	John Miller		Cleve.Shop	10–1869		Outside		4-4-0	#395
148	No. 5		Cleve.Shop	8–1871	14"x22"	Outside	50"	0-4-0	#36
149	No. 6		Cleve.Shop	8–1871	14"x22"	Outside	50"	0-4-0	#37
150			Cleve.Shop	11–1871		Outside		4-4-0	#149
151			Cleve.Shop	1–1872		Outside		4-4-0	#150
152			Grant	9–1871		Outside		4-4-0	#151
153			Grant	9–1871		Outside		4-4-0	#396
154			Cleve.Shop	9–1872		Outside		4-4-0	#152
155–157			Brooks	3–1872	16"x24"	Outside	60"	4-4-0	#397 to 399
158			C.C.C.& I.	1873	14"x22"	Outside	50"	0-4-0	#38
159			C.C.C.& I.	1874	14"x22"	Outside	50"	0-4-0	#39
160–161			C.C.C.& I.	1874		Outside		4-4-0	#400 to 401
162			C.C.C.& I.	1875		Outside		4-4-0	#402
163–165			C.C.C.& I.	1876		Outside		4-4-0	#403 to 405
166–167			Grant	1876		Outside		4-4-0	#406 to 407
168–169			C.C.C.& I.	1877		Outside		4-4-0	#408 to 409
170			C.C.C.& I.	1878	14"x22"	Outside	50"	0-4-0	#40
171–172			C.C.C.& I.	1878		Outside		4-4-0	#410 to 411
173–174			C.C.C.& I.	11–1878		Outside		4-4-0	#153 to 154
175			C.C.C.& I.	1879	17"x22"	Outside		4-4-0	#155
176			C.C.C.& I.	1880	17"x22"	Outside		4-4-0	#156
177			C.C.C.& I.	1881	16"x22"	Outside	50"	0-6-0	#41
201–209	Cincinnati & Springfield Engines —These were renumered to:								
42– 43			Grant					C–4–0	Switchers
157–161			Grant					4–4–0	Passenger
412–413								4–4–0	Freight
210–212	C. & S. Div.		Rogers	4–1872	16"x22"	Outside	66"	4-4-0	#162 to 164
213–216	C. & S. Div.		Rogers	3 & 4–1872	16"x22"	Outside	66"	4-4-0	#414 to 417
217–220			Brooks	1872	16"x24"	Outside	60"	4-4-0	#418 to 421
221			Grant	1872		Outside		4-4-0	#422
222–223			———	1876		Outside		4-4-0	#423 to 424

A Letter.

Southbridge, Mass., December 31st, 1916.

HERBERT FISHER, ESQ.

Dear Sir:

Your kind letter of November 30th was also received with many thanks. Yes, I went to the Mason Works in August, 1868 and served full apprenticeship and did other work for them. Finally, in 1877, when I came from a long trip that I took to Texas for them, I went to railroading, and for 38 years have held positions of responsibility upon various lines in this country and other countries. You no doubt by now, know from acquaintance there (as I must have some left) that have told you about me. With the exception of four years have not been engaged in the United States for 31 years. For 8½ years ending this summer my time has been spent in France upon their leading railway—the Paris, Lyons and Mediterranean, in advisory capacity to their president.

Am here engaged in settling the Haggerty estate which for nearly 80 years has been held intact, but through the death of an older sister, everything must now be sold and I am administrator. My next older sister that lives in Connecticut and myself are the sole heirs. Will be here perhaps a year, hence I am quite engaged. Have not been so far north for 21 years and the cold weather here to me is severe. Have not been to Taunton for 25 years. I assume all are living, yet I know it cannot be so. Perhaps you will write me about Colonel Mason (son of Mr. William Mason), John T. Meats (Sup't. Mason Machine Works), Mr. William R. Billings (Sup't. Taunton Locomotive Works) and others.

Wishing you a happy New Year which I extend to all, I am,

Very truly yours,

GEO. A. HAGGERTY.

Southbridge, Mass.,
December 27 and 30th, 1916.

HERBERT FISHER, ESQ.

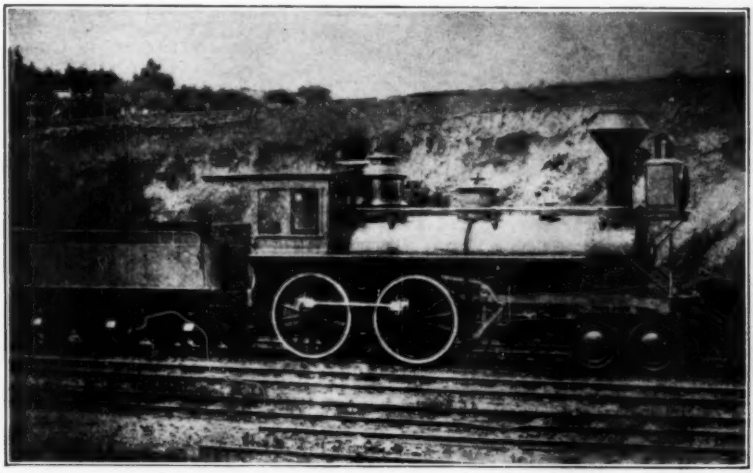
Dear Sir:

When your very interesting letter of Nov. 29th came here I did not intend that it should be from Thanksgiving to Christmas and New Year before making reply, yet it has so happened. While a brief formal answer might have been made earlier, such would not have suited me and I now write you in full.

I fully appreciate your delight as you saw the Norfolk County engines pass through Dedham bound for Boston. I can equally appreciate your boyish interest in the Boston & Providence engines of similar design and built (many of them) in Boston by the late Geo. S. Griggs, Master Mechanic. His last triumph in building inside connected locomotives were the "Viaduct", "David Tyler" and "Paul Revere", all with cylinders 17x22", driving wheels 5' 10". When he had completed the "David Tyler" in 1869, Mr. Griggs brought her to Taunton that the locomotive builders there might see what proved to be his last product, and I think they were the last "insiders" built in the United States. As a boy, I then saw Mr. Griggs and the "Tyler" as he passed through the Shops and I much admired him. Later on I came to know his sons and his brother Henry, all prominent in their day. Henry was instrumental in the upbuilding of the New York Locomotive Works at Rome. Just a few years after the "Tyler" was built (2 years) I had the greatest pleasure of riding on her several trips from Boston to Providence with Engineer Cole, who ran her on a fast express, stopping only at Mansfield and Pawtucket. She was perfection indeed.

Southbridge is *my* home town. The Southbridge & Blackstone R. R. was never completed under that name but graded out of here before I was born—to be exact, in 1851. The Boston, Hartford & Erie R. R. Co., built the road to Southbridge using the grade mentioned which for 14 years had been unfinished. In the fall of 1866, 50 years ago, the trains began to carry passengers to Blackstone and Boston—70 miles. Early in the race the old "Blackstone" appeared in her original condition (except she had been converted to a coal burner) and she hauled the morning passenger train in to Boston for a time. The largest

part of her was her driving wheels. Soon after then she was sold with the "Franklin" to Broad & Ward, Contractors, who built many miles of the B. H. & E. These two had 5′ 10″ driving wheels and when built were models of the "Rough and Ready", except they had but one escape pipe. Both had the outside frame and the drop hook valve motion with three levers in the cab, one for reversing, two for hooking, etc. They would make a full revolution before they would reverse. I have fired them both with coal. The "Blackstone" remained unaltered until the last and in or about 1872 she was sold for junk to Joshua Hunt, a junk dealer in Exchange St., Providence. She was 23 or 24 years old at the time.



The "Putnam" as Rebuilt by Geo. A. Haggerty.

The "Franklin" survived her by a number of years. She had better care and many alterations. You saw them before I did. When I first saw the "Franklin" she had been changed to a link motion and the outside frame removed—in 1870 or 1871. She got a new boiler, built at Woonsocket, and put into her frame at Waterford in the old engine house there equipped with hand tools, but well done. From then on, 1869, she and the "Blackstone" built many miles of the B. H. & E. west of Putnam, also the Lowell & Andover and the Hopkinton R. R.

In 1875, having served my time, and with a little more experience well known at Taunton (then), I took a $2500.00 contract of Mr. William H. Ward, successor to Broad & Ward, and rebuilt the "Franklin" here in Southbridge. With the tools afforded me by the cotton and woolen mills here, I did fairly well in this up country town. My erecting shop was a shed built up against a store house over a side track. Commencing in March, 1875, my shop was ready in two weeks and the "Franklin" freighted here from Waterford. I gave her a new set of driving wheels bought second hand from the Boston & Albany, 4′ 6″ to replace the 5′ 10″ originals. They were Hinkley wheels, taken from the "Ajax" all fitted and ready for use. They had commenced to rebuild the old "Ajax", found her boiler defective and condemned her, hence my bargain on wheels. I bought new side rods, dome casing, sand box, smoke stack, driving box linings, etc. at the Taunton Locomotive Works. The front boiler casting, door, figure plate, monogram plates, front truck springs, etc. at the Mason Works. The cylinder packing rings, hand rails and running board edges, all of brass, were made at the Taunton Works for me. A general overhauling was given to all working parts and all joints were made as tight as new. The tender was new entirely, built at Hinkley with a "Heggerty" tender frame and trucks. She was then part Taunton, Mason, Hinkley, "Haggerty" and a Woonsocket boiler. I gave the "Franklin" her first sand box. The "Blackstone" never had one. With their cylinders 15x18″ and 5′ 10″ drivers, carrying 110 lbs. of steam, they did not slip much and were fairly good in the snow. To the best of my recollection the "Blackstone" was 14x18″, but when I finished the "Franklin" she was 15⅜x 20″. You see the cranks of the "Ajax" had a 10″ throw, but the space between the ports of the "Franklin's" cylinders permitted me to use the 10″ cranks by reducing the part of the heads projecting into the cylinders, reducing the thickness of the pistons—running nearer the heads—and using wide packing rings. When finished she had only her original frame, cylinders, front truck frame, her slide throttle valve and bell. I gave her that rounding pilot beam and iron cow catcher, all made here. She retained her original guide bars, box crossheads, mainrods, rockers, pumps and eccentrics, but her ancient look was gone. As monograms with the makers name were then in use you will note my monogram between the driving wheels

which reads—Rebuilt by Geo. A. Haggerty, Southbridge, Mass., 1875. She was nicely painted and polished, ultramarine blue with red vermillion driving and truck wheels, Russia iron jacket and brass bands. When finished I hauled coal trains to Southbridge from Webster—10 miles—on trial trips. I was very proud of my work which took from March to September, particularly so because I was under 21 years of age while the "Franklin" was 26. When tested by actual service I had nothing to change or alter, everything was right except a front truck box which ran hot. I changed her name to "Putnam" as you will see. The owner did not get immediate contracts and through myself, he sold her to the Cincinnati, Rockport & Southwestern R. R. in Indiana and was worn out there.

The Southbridge & Blackstone engines never ran to Southbridge. The road under various names was built out of South Boston and then from Blackstone to Putnam. I may mention Norfolk County, Massachusetts Midland, Boston & New York Central, Boston, Hartford & Erie. The Southbridge & Blackstone engines ran trains from Boston to Putnam, Ct., among them a steamboat train that connected with the Norwich & Worcester boat train at Putnam. The road did not pay and was abandoned west of Blackstone. West of Douglas it grew up with trees, ties rotted out and in time the rails were taken up between East Thompson and Putnam, 17 or 18 miles, and laid a like distance to Southbridge. They were old rusty iron chair rails. From East Douglas to Blackstone it was kept open by the Douglas Axe Co. who operated with an old engine named the "Douglas". When well completed to Southbridge the road to Putnam was relaid and built on to Willimantic and Hartford.

The name of Henry M. Holbrook is very familiar. He was a director of the Western R. R. (Worcester to Albany) and lived at Palmer.

I enclose a photo of the "Franklin" now the "Putnam" and hope you will be interested in it and my pen picture of what I did to her in this town away up among the miniature mountains of Worcester County.

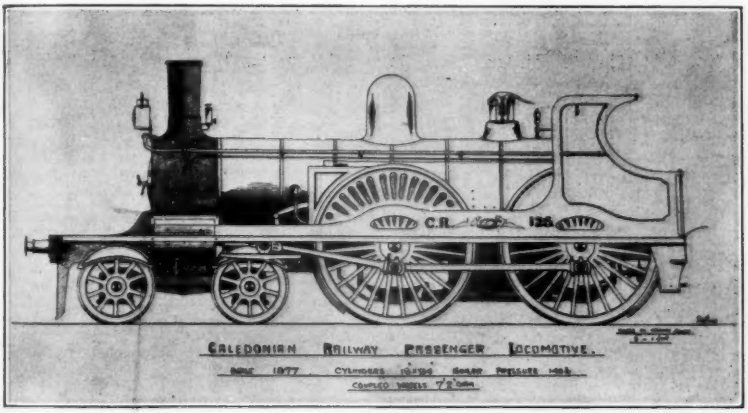
Very truly yours,

Geo. A. Haggerty.

Caledonian Rly. 4-4-0 Locomotive.

In an article appearing in Bulletin No. 14 of this Society, entitled "First Scottish 4-4-0 Locomotives," reference was made to the Caledonian locomotive here illustrated.

It was not however included at the time, so that its insertion in this issue—by the kindness of the officers of the R. & L. H. S. (Inc.)—is fitting.



Drawn by J. W. Smith.

This is chiefly because without this drawing the text of the article is incomplete in the description of the Caledonian section.

No more need be added here, except to remark that the drawing now shown should be considered in conjunction with the subject matter.

JOHN W. SMITH.

Locomotives on the New York & Erie R. R.

From Annual Report of 1856 With Additions.

O.C.=Outside connected; H.C=Half Crank; F.C.=Full Crank.

Name	No.	Builder	Builders No.	Date Built	Type	Use	Wt. Eng.	Wt. Driv.	Wt. Tend.	Capy.	Cyls.	Driv.	
Eleazar Lord	1	Wm. Norris		Dec. 1840	440	Frt.	32000	22300	36500	1116	13x20	4'-0"	O.C.
Piermont	2	Wm. Norris		Dec. 1840	440	Grvl.	38000	27750	36500	1116	13x20	4'-0"	O.C.
Rockland	3	Wm. Norris		Dec. 1840	440	Frt.	36675	25800	36500	1116	13x20	4'-0"	O.C.
Orange	4	Wm. Norris		Jan. 1841	440	Frt.	30700	21100	36500	1116	10¾x18	4'-7"	O.C.*
Ramapo	5	Wm. Norris		Jan. 1841	440	Frt.	31400	21800	36500	1116	10¾x18	4'-7"	O.C.
Sullivan	6	Rogers K. & G.	80	Mar. 31, 1846	440	Frt.	40625	24250	33450	1517	15½x22	5'-0"	O.C.
Delaware	7	Rogers K. & G.	81	May 6, 1846	440	Frt.	48200	31300	33450	1517	15½x22	5'-0"	O C.
Sussex	8	M. W. Baldwin	268	May, 1847	440	Pass.	42600	30600	35050	1631	14x18	5'-0"	O C.
New York	9	M. W. Baldwin	269	Aug. 1847	060	Frt.	44200	44200	35050	1631	15x18	3'-9½"	O.C.†
	10	Wm. Norris		Nov. 1847	440	Frt.	43920	26880	36500	1116	12½x26	5'-0"	O.C.
	11	Sw. Smith & Co.	1	May 1848	440	Pass.	50910	28750	35170	1634	17x20	6'-0"	O.C.
Susquehanna	12	Rogers K. & G.	130	June 7, 1848	460	Frt.	58000	42300	37500	1517	17x20	5'-0"	H C.
	13	Sw. Smith & Co.	2	June 1848	440	Pass.	51700	32600	37760	1634	17x20	6'-0"	H C.
	14	Sw. Smith & Co.	3	Aug. 1848	440	Frt.	49300	28800	37760	1634	17x20	5'-0"	H.C.
	15	Sw. Smith & Co.	4	Oct 1848	440	Frt.	50900	27800	37760	1634	17x20	5'-0"	H.C.
	16	Sw. Smith & Co.	5	Dec. 1848	440	Frt.	50830	30540	37760	1634	17x20	5'-0"	H.C.
	17	Sw. Smith & Co.	6	Jan. 1849	440	Pass.	53400	31900	37760	1634	17x20	6'-0"	H C.
Alleghany	18	Rogers K. & G.	152	Dec. 11, 1848	440	Pass.	56500	35750	40100	1617	17x20	6'-0"	H C.
Cataraugus	19	Rogers K. & G.	154	Dec. 20, 1848	440	Pass.	54700	34100	40100	1617	17x20	6'-0"	H.C.
Tioga	20	M. W. Baldwin	344	Dec. 1848	440	Pass.	56460	33600	38000	1613	17x20	6'-0"	H.C.
Chemung	21	M. W. Baldwin	345	Jan. 1849	440	Pass.	57950	31200	38000	1613	17x20	6'-0"	H.C.
Bradford	22	M. W. Baldwin	346	Feb. 1849	440	Frt.	50100	32700	38000	1613	17x20	5'-0"	H.C.
Tompkins	23	M. W. Baldwin	347	Mar. 1849	440	Pass.	56650	34860	38000	1613	17x20	6'-0"	H C.
Cortlandt	24	M. W. Baldwin	348	Apr. 1849	440	Frt.	54150	33000	38000	1613	17x20	5'-0"	H C.
Wayne	25	M. W. Baldwin	349	May 1849	440	Frt.	53600	31660	38000	1613	17x20	5'-0"	H.C.
Otsego	26	M. W. Baldwin	350	May 1849	440	Frt.	54400	32700	38000	1613	17x20	5'-0"	H.C.
Seneca	27	M. W. Baldwin	351	June 1849	440	Pass.	56380	34060	38000	1613	17x20	6'-0"	H C.
Chautauque	28	Rogers K. & G.	155	Jan. 3, 1849	440	Pass.	55750	35100	40100	1617	17x20	6'-0"	H C.
Munroe	29	Rogers K. & G.	156	Jan. 19, 1849	440	Pass.	56870	34860	40100	1617	17x20	6'-0"	H.C.

*Sold to Attica & Horneusville R. R. 1851. †Flexible Beam Truck.

*Sold to Attica & Horneusville R. R. 1851. †Flexible Beam Truck.

Name	No.	Builder	Builders No.	Date Built	Type	Use	Wt. Eng.	Wt. Driv.	Wt. Tend.	Capy.	Cyls.	Driv.	
Genesee	30	Rogers K. & G.	160	Feb. 7, 1849	440	Frt.	54900	33400	40100	1617	17x20	5′-0″	H.C.
Onandaga	31	Rogers K. & G.	161	Feb. 16, 1849	440	Frt.	54370	34230	40100	1617	17x20	5′-0″	H.C.
Ontario	32	Rogers K. & G.	162	Feb. 26, 1849	440	Pass.	56200	34850	40100	1617	17x20	6′-0″	H.C.
Livingston	33	Rogers K. & G.	165	Mar. 23, 1849	460	Frt.	65150	48100	40100	1617	18x20	5′-0″	H.C.
Yates	34	Rogers K. & G.	167	Apr. 14, 1849	460	Frt.	65000	49000	40100	1617	18x20	5′-0″	H.C.
Wyoming	35	Rogers K. & G.	171	May 21, 1849	460	Frt.	64700	47850	40100	1617	18x20	5′-0″	H.C.
	36	Sw. Smith & Co.		Mar. 1849	440	Pass.	54500	33750	37950	1634	17x20	6′-0″	H.C.
	37	Sw. Smith & Co.		Apr. 1849	440	Pass.	53650	32750	37600	1634	17x20	6′-0″	H.C.
	38	Sw. Smith & Co.		May 1849	440	Frt.	53380	32700	37166	1634	17x20	5′-0″	H.C.
	39	Sw. Smith & Co.		July 1849	440	Pass.	55100	32200	38050	1634	17x20	5′-0″	H.C.
	40	Rogers K. & G.	201	Jan. 18, 1850	440	Frt.	55300	35000	40100	1617	17x20	5′-0″	H.C.
	41	Rogers K. & G.	203	Feb. 4, 1850	440	Frt.	55850	33700	40100	1617	17x20	5′-0″	H.C.
	42	Rogers K. & G.	207	Mar. 13, 1850	440	Frt.	56400	30400	40100	1617	17x20	5′-0″	H.C.
	43	Rogers K. & G.	185	Aug. 21, 1849	440	Frt.	56225	32800	40100	1617	17x20	5′-0″	H.C.
	44	Rogers K. & G.	186	Sep. 12, 1849	440	Frt.	54500	33500	40600	1617	17x20	5′-0″	H.C.
	45	Rogers K. & G.	187	Sep. 24, 1849	440	Frt.	53470	32700	40600	1617	17x20	5′-0″	H.C.
	46	Sw. Smith & Co.		Oct. 1849	440	Frt.	52700	32200	37760	1634	17x20	5′-0″	H.C.
	47	Sw. Smith & Co.		Nov. 1849	440	Frt.	52750	33920	43100	1634	17x20	5′-0″	H.C.
	48	Sw. Smith & Co.		Dec. 1849	440	Frt.	50700	32100	38000	1634	16x20	5′-0″	H.C.
	49	Sw. Smith & Co.		Jan. 1850	440	Frt.	60700	43900	40600	1634	17x20	5′-0″	H.C.
	50	Sw. Smith & Co.		Mar. 1850	460	Frt.	63300	46400	45400	1634	17x20	5′-0″	H.C.
	51	Sw. Smith & Co.		Apr. 1850	460	Frt.	61550	45050	39050	1634	17x20	5′-0″	H.C.
	52	Boston Loco. W.		Nov. 1849	440	Pass.	47575	30000	32000	1499	15x20	5′-0″	F.C.
	53	Boston Loco. W.		Dec. 1849	440	Pass.	47230	29250	32000	1499	15x20	5′-0″	F.C.
	54	Boston Loco. W.		Dec. 1849	440	Frt.	47920	30050	32000	1499	15x20	5′-0″	F.C.
	55	Rogers K. & G.	208	Mar. 25, 1850	440	Frt.	55500	35400	40100	1617	15¾x20	5′-0″	H.C.
	56	Rogers K. & G.	212	May 1, 1850	440	Pass.	54700	33920	40100	1617	15x20	6′-0″	H.C.
	57	M. W. Baldwin	377	July 1850	080	Frt.	73700	73700	40920	1747	18¼x23	4′-0″	O.C.
	58	M. W. Baldwin	378	July 1850	080	Frt.	72900	72900	40920	1747	18¼x23	4′-0″	O.C.
	59	M. W. Baldwin	379	Jan. 1851	080	Frt.	66100	66100	36920	1613	17x22	3′-9½″	O.C.
	60	M. W. Baldwin	380	Apr. 1851	080	Frt.	66750	66750	36920	1613	17x22	3′-9½″	O.C.
	61	Taunton L. M. Co.		July 1850	440	Frt.	57500	36900	38250	1613	17x20	5′-0″	F.C.
	62	Taunton L. M. Co.		Nov. 1850	440	Frt.	55300	35000	36900	1613	17x20	5′-0″	F.C.
	63	Taunton L. M. Co.		Nov. 1850	440	Frt.	59400	39900	36250	1613	17x20	5′-0″	F.C.
	64	Rogers K. & G.	223	Aug. 10, 1850	440	Wood	55600	35600	35000	1617	17x20	5′-0″	O.C.
	65	Rogers K. & G.	224	Aug. 24, 1850	440	Frt.	55300	35350	40100	1617	17x20	5′-0″	O.C.
	66	Rogers K. & G.	229	Sep. 23, 1850	440	Pass.	54500	33750	40100	1617	17x20	6′-0″	F.C.
	67	Sw. Smith & Co.		June 1850	460	Frt.	60500	43800	39800	1634	17x20	5′-0″	H.C.

Name	No.	Builder	Builders No.	Date Built	Type	Use	Wt. Eng.	Wt. Driv.	Wt. Tend.	Capy.	Cyls.	Driv.	
	68	Sw. Smith & Co.		July 1850	460	Frt.	62550	45500	44050	1634	17x20	5′-0″	H.C.
	69	Sw. Smith & Co.		Aug. 1850	460	Frt.	61700	45800	45500	1634	17x20	5′-0″	H.C.
	70	Sw. Smith & Co.		Oct. 1850	440	Pass.	53800	33900	43100	1634	17x20	6′-0″	F.C.
	71	Sw. Smith & Co.		Oct. 1850	440	Pass.	54050	34300	41500	1634	17x20	6′-0″	F.C.
	72	Sw. Smith & Co.		Nov. 1850	460	Frt.	61100	43600	44850	1634	17x20	4′-6″	F.C.
	73	Sw. Smith & Co.		Dec. 1850	460	Frt.	58450	40050	38650	1634	17x20	4′-6″	F.C.
	74	Sw. Smith & Co.		Jan. 1851	460	Frt.	56900	39150	42100	1634	17x20	4′-6″	F.C.
	74	Sw. Smith & Co.		Jan. 1851	460	Frt.	60500	43650	40350	1634	17x20	4′-6″	F.C.
	76	Sw. Smith & Co.		Feb. 1851	460	Frt.	61550	45050	42600	1634	17x20	4′-6″	F.C.
	77	Sw. Smith & Co.		Mar. 1851	460	Frt.	60700	43800	45100	1634	17x20	4′-6″	F.C.
	78	Sw. Smith & Co.		April 1851	460	Frt.	59400	38975	44275	1634	17x20	4′-6″	F.C.
	79	Sw. Smith & Co.		April 1851	460	Frt.	61700	45700	43300	1634	17x20	4′-6″	F.C.
	80	Sw. Smith & Co.		May 1851	460	Frt.	59900	42050	40500	1634	17x20	4′-6″	F.C.
	81	Sw. Smith & Co.		June 1851	460	Frt.	58600	39050	42750	1634	17x20	4′-6″	F.C.
	82	Sw. Smith & Co.		Aug. 1851	460	Frt.	60050	43500	42750	1634	17x20	4′-6″	F.C.
	83	Sw. Smith & Co.		Sep. 1851	460	Frt.	59750	41900	44850	1634	17x20	4′-6″	F.C.
	84	Norris Bros.		Jan. 1851	440	Pass.	58050	40000	36500	1751	14x32	7′-0″	O.C.
	85	Norris Bros.		Feb. 1851	440	Pass.	57330	39030	36500	1751	14x32	7′-0″	O.C.
	86	Rogers K. & G.	245	Feb. 1, 1851	460	Frt.	65175	47000	40100	1617	17x20	5′-0″	H.C.
	87	Boston Loco. W.		May 1851	422	Pass.	49300	30600	33500	1514	15x20	5′-7″	F.C.
	88	Ross Winans		May 1851	080	Frt.	56000	56000	37400	1976	19x22	3′-7″	O.C.*
	89	Ross Winans		May 1851	080	Frt.	56000	56000	37400	1976	19x22	3′-7″	O.C.*
Dunkirk	90	Boston Loco. W.		Nov. 1850	440	Pass.	50800	32600	33500	1713	16x20	5′-7″	F.C.
	91	Boston Loco. W.		Nov. 1850	440	Pass.	52450	35100	33860	1713	16x20	5′-7″	F.C.
	92	Boston Loco. W.		Nov. 1850	440	Pass.	49510	30840	33290	1713	16x20	5′-7″	F.C.
	93	Boston Loco. W.		Nov. 1850	440	Pass.	50975	33050	34000	1713	16x20	5′-7″	F.C.
	94	Boston Loco. W.		Dec. 1850	440	Pass.	52600	35350	35050	1713	16x20	5′-7″	F.C.
	95	Boston Loco. W.		Dec. 1850	440	Pass.	49930	30950	33970	1713	16x20	5′-7″	F.C.
	96	Boston Loco. W.		Dec. 1850	440	Pass.	50600	32740	34650	1713	16x20	5′-7″	F.C.
	97	Boston Loco. W.		Dec. 1850	440	Pass.	51050	33400	34500	1713	16x20	5′-7″	F.C.
	98	Boston Loco. W.		Feb. 1850	440	Pass.	51675	33860	33875	1713	16x20	5′-7″	F.C.
	99	Boston Loco. W.		Jan. 1850	440	Pass.	52100	34900	34060	1713	17x20	5′-7″	F.C.
	100	Rogers K. & G.	251	Mar. 15, 1851	440	Pass.	58600	38900	39200	1617	17x20	6′-0″	F.C.
	101	Rogers K. & G.	252	Mar. 15, 1851	440	Pass.	56650	37050	40100	1617	17x20	6′-0″	F.C.
	102	Rogers K. & G.	257	Apr. 10, 1851	440	Pass.	56400	36900	41000	1617	17x20	6′-0″	F.C.
	103	Rogers K. & G.	258	Apr. 14, 1851	440	Pass.	56600	37000	40100	1617	17x20	6′-0″	F.C.
	104	Rogers K. & G	261	May 28, 851	440	Pass.	57450	37350	39950	1617	17x20	6′-0″	F.C.

*Camel Back

*Camel Back

Name	No.	Builder	Builders No.	Date Built	Type	Use	Wt. Eng.	Wt. Driv.	Wt. Tend.	Capy.	Cyls.	Driv.	
	105	Rogers K. & G.	263	Jun. 13, 1851	440	Pass.	57975	37575	40050	1617	17x20	6'-0"	F.C.
	106	Rogers K. & G.	268	July 9, 1851	440	Frt.	54850	34900	39700	1617	17x20	5'-0"	F.C.
	107	Rogers K. & G.	272	Aug. 5, 1851	440	Frt.	56260	35875	40260	1617	17x20	5'-0"	F.C.
	108	Rogers K. & G.	280	Sep. 17, 1851	440	Frt.	55800	35450	39050	1617	17x20	5'-0"	F.C.
	109	Rogers K. & G.	290	Nov. 18, 1851	440	Frt.	54900	35000	39840	1617	17x20	5'-0"	F.C.
	110	Rogers K. & G.	292	Dec. 11, 1851	440	Pass.	56350	36140	40275	1617	17x20	5'-0"	F.C.
	111	Rogers K. & G.	295	Dec. 24, 1851	440	Pass.	56100	35800	41050	1617	17x20	6'-0"	F.C.
	112	Boston Loco. W.		July 1851	422	Pass.	49560	31000	33500	1514	15x20	5'-7"	F.C.
	113	Taunton L. M. Co.		May 1851	440	Frt.	59450	38510	38230	1613	17x20	5'-0"	F.C.
	114	Taunton L. M. Co.		May 1851	440	Frt.	58960	37700	37960	1613	17x20	5'-0"	F.C.
	115	Taunton L. M. Co.		June 1851	440	Frt.	58060	37570	37320	1613	18x20	5'-0"	F.C.
	116	Taunton L. M. Co.		June 1851	440	Frt.	59050	38175	38230	1613	18x20	5'-0"	F.C.
	117	Taunton L. M. Co.		July 1851	440	Frt.	58860	37920	38050	1613	18x20	5'-0"	F.C.
	118	Taunton L. M. Co.		July 1851	440	Frt.	58000	38050	37840	1613	18x20	5'-0"	F.C.
	119	Boston Loco. W.		June 1851	440	Frt.	52300	32300	34500	1713	16x26	5'-1½"	O.C.
	120	Boston Loco. W.		June 1851	440	Frt.	52530	32650	35100	1713	16x26	5'-1½"	O.C.
	121	Boston Loco. W.		May 1851	440	Frt.	53100	33250	35850	1713	16x26	5'-1½"	O.C.
	122	Boston Loco. W.		June 1851	440	Frt.	52300	32300	34960	1713	16x26	5'-1½"	O.C.
	123	Boston Loco. W.		June 1851	440	Frt.	52675	31775	36050	1713	16x26	5'-1½"	O.C.
	124	Boston Loco. W.		July 1851	440	Frt.	52500	32450	35175	1713	16x26	5'-1½"	O.C.
	125	Amoskeag M. Co.	13	May 1851	060	Frt.	48235	48235	38450	1810	18x20	4'-7"	F.C.
	126	Amoskeag M. Co.	14	May 28, 1851	060	Frt.	48360	48360	38450	1810	18x20	4'-7"	F.C.
	127	Boston Loco. W.		Dec. 1851	060	Pass.	53975	34000	40100	2008	17x20	5'-6"	F.C.
	128	Boston Loco. W.		Dec. 1851	060	Pass.	54400	34950	33100	1828	17x20	5'-6"	F.C.
	129	Boston Loco. W.		Dec. 1851	060	Pass.	54150	34200	32850	1828	17x20	5'-6"	F.C.
	130	Boston Loco. W.		Dec. 1851	060	Pass.	54000	34600	41300	2008	17x20	5'-6"	F.C.
	131	Boston Loco. W.		Jan. 1852	060	Pass.	53800	33980	32960	1828	17x20	5'-6"	F.C.
	132	Boston Loco. W.		Jan. 1852	060	Pass.	53630	36050	33000	1828	17x20	5'-6"	F.C.
	133	N. J. L. & M. Co.		Nov. 1851	060	Frt.	50700	32100	40600	1634	16x20	5'-0"	O.C.
	134	N. J. L. & M. Co.		Dec. 1851	060	Frt.	51260	33240	39050	1634	16x20	5'-0"	O.C.
	135	N. J. L. & M. Co.		Jan. 1852	440	Frt.	50980	32800	42800	1634	16x20	5'-0"	O.C.
	136	N. J. L. & M. Co.		Feb. 1852	460	Frt.	60100	43600	41500	1634	17x20	4'-6"	F.C.
	137	N. J. L. & M. Co.		Feb. 1852	460	Frt.	60500	43650	38650	1634	17x20	4'-6"	F.C.
	138	N. J. L. & M. Co.		Mar. 1852	460	Frt.	61550	45000	40350	1634	17x20	4'-6"	F.C.
	139	N. J. L. & M. Co.		July 1852	460	Frt.	59900	42160	42750	1634	17x20	4'-6"	F.C.
	140	N. J. L. & M. Co.		Aug. 1852	460	Frt.	60050	43500	41960	1634	17x20	4'-6"	F.C.
	141	N. J. L. & M. Co.		Aug. 1852	460	Frt.	61000	44100	42040	1634	17x20	4'-6"	F.C.
	142	Essex Co.		Nov. 1852	440	Frt.	58250	36450	38900	1845	17x20	4'-6"	F.C.

Name	No.	Builder	Builders No.	Date Built	Type	Use	Wt. Eng.	Wt. Driv.	Wt. Tend.	Capy.	Cyls.	Driv.	
	143	Essex Co.		Nov. 1852	440	Frt.	58250	36450	38900	1845	17x20	4'-6"	F.C.
	144	Danforth, Cooke & Co..		Oct. 1853	440	Pass.	54075	35200	33550	1720	16x20	5'-0"	O C.
	145	Danforth, Cooke & Co..		Nov. 1853	440	Frt.	65850	42250	40000	2000	18x20	5'-0"	F.C.
	146	Danforth, Cooke & Co..		Dec. 1853	440	Frt.	66200	43300	40000	2000	18x20	5'-0"	F.C.
	147	Danforth, Cooke & Co..		Jan. 1854	440	Frt.	65700	43100	40000	2000	18x20	5'-0"	F.C
	148	Danforth, Cooke & Co..		Feb. 1854	440	Frt.	65800	43200	40000	2000	18x20	5'-0"	F.C.
	149	Danforth, Cooke & Co..		Mar. 1854	440	Frt.	66100	43500	40000	2000	18x20	5'-0"	F.C.
	150	Danforth, Cooke & Co..		Mar. 1854	440	Frt.	65850	42900	40000	2000	18x20	5'-0"	F.C.
	151	Danforth, Cooke & Co..		April 1854	440	Frt.	65800	43150	40000	2000	18x20	5'-0"	F.C.
	152	Danforth, Cooke & Co..		May 1854	440	Frt.	66250	41600	40000	2000	18x20	5'-0"	F.C.
	153	Danforth, Cooke & Co..		May 1854	440	Frt.	65850	41950	40000	2000	18x20	5'-0"	F.C.
	154	Danforth, Cooke & Co..		June 1854	440	Frt.	65800	42000	40000	2000	18x20	5'-0"	F.C.
	155	Danforth, Cooke & Co..		July 1854	440	Frt.	65100	42000	40000	2000	18x20	5'-0"	F.C.
	156	Danforth, Cooke & Co..		July 1854	440	Frt.	66150	43250	40000	2000	18x20	5'-0"	F.C.
	157	Danforth, Cooke & Co..		Aug. 1854	440	Frt.	65850	42900	40000	2000	18x20	5'-0"	F.C.
	158	Danforth, Cooke & Co..		Aug. 1854	440	Frt.	65900	43000	40000	2000	18x20	5'-0"	F.C.
	159	N. J. L. & C. Co.		Feb. 1854	440	Pass.	65250	42800	35000	1320	18x20	6'-0"	F.C.
	160	N. J. L. & M. Co.		Feb. 1854	440	Pass.	65800	43050	35000	1320	18x20	6'-0"	F.C.
	161	N. J. L. & M. Co.		Mar. 1854	440	Frt.	63800	41150	40000	2000	18x20	5'-0"	F.C.
	162	N. J. L. & M. Co.		April 1854	440	Frt.	62950	40000	40000	2000	18x20	5'-0"	F.C.
	163	N. J. L. & M. Co.		April 1854	440	Frt.	65000	41200	40000	2000	18x20	5'-0"	F.C.
	164	N. J. L. & M. Co.		May 1854	440	Frt.	63700	41100	40000	2000	18x20	5'-0"	F.C.
	165	Seth Wilmarth		June 1854	440	Frt.	63950	41000	40000	2000	18x20	5'-0"	F.C.
	166	Seth Wilmarth		Mar. 1854	440	Frt.	64200	42050	40000	2000	18x20	5'-0"	F.C.
	167	Seth Wilmarth		April 1854	440	Frt.	65100	41725	40000	2000	18x20	5'-0"	F.C.
	169	Seth Wilmarth		April 1854	440	Frt.	64950	40800	40000	2000	18x20	5'-0"	F.C.
	168	Seth Wilmarth		May 1854	440	Frt.	66050	45000	40000	2000	18x20	5'-0"	F.C.
	170	Seth Wilmarth		June 1854	440	Frt.	65900	42700	40000	2000	18x20	5'-0"	F.C.
	171	Seth Wilmarth		June 1854	440	Frt.	65800	42000	40000	2000	18x20	5'-0"	F.C.
	172	Seth Wilmarth		July 1854	440	Frt.	64700	41300	40000	2000	18x20	5'-0"	F.C.
	173	Seth Wilmarth		July 1854	440	Frt.	65850	42500	40000	2000	18x20	5'-0"	F.C.
	174	Seth Wilmarth		Aug. 1854	440	Frt.	64950	41500	40000	2000	18x20	5'-0"	F.C.
	175	Seth Wilmarth		Aug. 1854	440	Frt.	65800	42750	40000	2000	18x20	5'-0"	F.C.
	176	Seth Wilmarth		Aug. 1854	440	Frt.	66100	42750	40000	2000	18x20	5'-0"	F.C.
	177	Seth Wilmarth		Nov. 1854	440	Frt.	65300	42100	40000	2000	18x20	5'-0"	F.C.
	178	Seth Wilmarth		Nov. 1854	440	Frt.	63900	41000	40000	2000	18x20	5'-0"	F.C.
	179	Seth Wilmarth		Nov. 1854	440	Frt.	66025	42900	40000	2000	18x20	5'-0"	F.C.

The above list furnished through the courtesy of W. A. Lucas.

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Name	No.	Builder	Builders No.	Date Built		Type	Use	Wt. Eng.	Wt. Driv.	Wt. Tend.	Capy.	Cyls.	Driv.	
	180	Seth Wilmarth		Nov.	1854	440	Frt.	65700	41300	40000	2000	18x20	5'-0"	F.C.
	181	Seth Wilmarth		Nov.	1854	440	Frt.	65800	41950	40000	2000	18x20	5'-0"	F.C.
	182	Seth Wilmarth		Nov.	1854	440	Frt.	66200	43250	40000	2000	18x20	5'-0"	F C.
	183	Seth Wilmarth		Nov.	1854	440	Frt.	65900	43000	40000	2000	18x20	5'-0"	F.C.
	184	Seth Wilmarth		Nov.	1854	440	Frt.	65850	42750	40000	2000	18x20	5'-0"	F.C.
	185	Seth Wilmarth		Nov.	1854	440	Frt.	65300	42500	40000	2000	18x20	5'-0"	F.C.
	186													
	187													
	188													
	189													
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	198	Seth Wilmarth		Sept.	1854	440	Frt.	66450	43100	40000	2000	18x20	5'-6"	F.C.
	199	Seth Wilmarth		Sept.	1854	440	Pass.	66600	43450	40000	2000	18x20	5'-6"	F.C.
	200	Seth Wilmarth		Sept.	1854	440	Frt.	66325	43000	40000	2000	18x20	5'-6"	F C.
	201	Rogers K. & G.	497	June 9,	1854	440	Pass.	65800	41500	40000	2000	18x20	5'-6"	F C.
	202	Rogers K. & G.	502	July	1854	440	Pass.	65850	41500	40000	2000	18x20	5'-6"	F.C.
	203	Rogers K. & G.	507	July	1854	440	Pass.	66350	41350	40000	2000	18x20	5'-6"	F.C.
	204	Rogers K & G.	512	July 29,	1854	440	Pass.	66100	40050	40000	2000	18x20	5'-6"	F.C.
	205	N. J. L. & M. Co.		Aug.	1854	440	Pass.	65850	40250	40000	2000	18x20	6'-0"	F C.
	206	N. J. L. & M. Co.		Nov.	1854	440	Pass.	65650	40115	40000	2000	18x20	6'-0"	F C.
	207	N. J. L. & M. Co.		Aug.	1854	440	Frt.	62950	40250	40000	2000	18x20	5'-0"	F.C.
	208	N. J. L. & M. Co.		Oct.	1854	440	Frt.	65800	41000	40000	2000	18x20	5'-0"	F.C.
	209	N. J. L. & M. Co.		April	1855	440	Frt.	67000	40050	42240	2000	17x24	5'-0"	O C.
	210	N. J. L. & M. Co.		April	1855	440	Frt.	67000	40050	42240	2000	17x24	5'-0"	O C.
	211	N. J. L. & M. Co.		July	1855	440	Frt.	67000	40050	42240	2000	17x24	5'-0"	O C.
	212	N. J. L. & M. Co.		Sept.	1855	440	Frt.	67000	40050	42240	2000	17x24	5'-0"	O C.
	213	Sw. Smith & Co.		Dec.	1853	440	Pass.	56760	36900	35350	1800	16x22	6'-0"	O.C.
	214	Sw. Swith & Co.		Dec.	1853	440	Pass.	56300	36450	35350	1800	16x22	6'-0"	O C.
	215	N. J. L. & M. Co.		Nov.	1853	440	Pass.	57200	36960	38500	1800	16x20	5'-6"	O C.
	216	N. J. L. & M. Co.		Nov.	1853	440	Pass.	65100	41300	40000	2000	18x20	5'-6"	F.C.

Recollections of the Broad Gauge Line to Plymouth (England).

By Henry Shapcote.

It was in May, 1876, when the Narrow gauge came to Devonport. As is probably known to most of my readers, Plymouth (Old, old Plymouth) was on the main line of the Broad Gauge (7′) from Paddington. This line, laid out by the famous Brunel, was at first Great Western to Bristol, then Bristol & Exeter to the latter city, the last 52 miles to Millbay station, Plymouth being owned by the South Devon Co. About half a mile from the latter station the Cornwall Ry. branched off, which eventually arrived at Falmouth via Truro, where it made a connection with the old West Cornwall, and proceeded to Penzance, the final terminus, by means of a third rail laid to accommodate the Broad Gauge, the old West Cornwall being narrow gauge. The South Devon Co. were in very low water by 1870, though better off than the Cornwall Co. They had their own rolling stock, while the Cornwall Ry. only had coaching stock, their trains being worked by South Devon engines. These engines were the earliest in my recollection. They were all saddle tanks—the passenger ones being 4-4-0, the goods 0-6-0. I did not know until 1876 that there were any tender engines, thinking that what I saw in pictures must be old and obsolete.

For many years, indeed ever since the Railway Mania, the London & South Western Co. had aimed at the "far West." In 1872 they, under the name of the Devon and Cornwall Co., had got as far as Lydford, a station on the South Devon branch to Launceston, from a junction 3 miles east of Plymouth. They then applied to Parliament for powers to oblige the South Devon Ry. to lay a third rail to Plymouth, to allow their trains to run to that town. The naval and military authorities supported this, in order to get the arsenal and dockyard at Devonport in physical connection with the north and east. As is known to most of my readers, the broad gauge was at this time confined to the Great Western and its daughter lines, etc., and by 1872 a large part even of this had been altered to the national 4′-8½″ or narrow gauge as it was termed in Devon. The South Devon train services were poor owing to the steep gradients, the steepest on any main line in the country, with the exception of the

Lickey incline on the Midland Ry. near Bomsgrove. The staff were very rude and disobliging, so much so that a railway employee in Plymouth had become a byword for incivility. The stations were small and dark, Millbay being a typical sample of the rest. Consequently the advent of the London & South Western was hailed with delight by the inhabitants of Plymouth and Devonport. This company got the powers not only to run over the South Devon Ry. from Lydford to a point three-quarters of a mile from Millbay, but also to construct a loop from there to the Cornwall Ry. and a branch thence to the Rectory Glebe close to the barracks at Devonport, where they constructed a terminus—the finest station then in the south of England by a long way, unless S. David's, Exeter, built in 1864 be excepted. At any rate, it was the finest station the London & South Western had on their system and even now is remarkable for its spacious platforms and general convenience. No station in Plymouth comes near it, though Millbay has been rebuilt and Friany (L. & S. W.) constructed. I well remember the opening day, 1st May, 1876. My father was at the opening and told us about it. I soon went to look at the "new" engines. Very different were they from the South Devon. They were quite peculiar in their way, being the designs of Mr. J. Beattie. They were six-wheeled, outside cylinder, 2-4-0's with curious domes and valves on the boiler. Wheels were 6′ or 6′ 6″ and cylinders 17″x22″. The first stationed at Devonport were the "Arrow," "Alaric" and "Hecate." This last was my favorite. It had 5′ 10″ driving wheels. "Arrow" had 6′ 6″ driving wheels. Other similar engines, "Apollo," "Princess," "Zephyr" and "Saracen" appeared. The London & South Western Co. soon saw that they must cater for the comparatively poor people of the district, and, following the example of the Midland Co., they made all their trains, with the exception of two, 3rd class, at a penny a mile. The consequence was that they secured nearly all the London traffic and a large share of even the Bristol and Bath passengers from the west via Templecombe. Their coaches were far more comfortable than those of the South Devon Ry., though the curves on the line made travelling very uneasy in parts. They appointed a most excellent Superintendent at Devonport, and the civility and thoughtfulness of the staff were the talk of the towns. Many invidious comparisons were made. The goods traffic, too, at once became important as there was no break of gauge.

In 1877 North Road, joint station just outside Plymouth, was opened by the Great Western and South Devon, and the London & South Western had the use of it for a rent.

The Gt. Western Co. before 1876 realized that they must do something to protect themselves. They purchased the B. & E. Ry. and took over the working of the South Devon and Cornwall Railroad from March 1876. The old South Devon and Bristol & Exeter engines were numbered with their own, and new rolling stock replaced the old six-wheeled spoked coaches that had run for many years. New eight wheel bogie "composites" were put on the through trains. These we called "saloons" from their "cleve story" roofs and comfortable fittings. It was some years, though, before the third class eight wheelers arrived. Most of these altered to "narrow gauge" are still running—a wonderful testimony to Swindon workmanship. There were about 90 South Devon engines taken over and over 100 Bristol & Exeter. The latter had, like the South Devon, a large number of 4-4-0 saddle tanks with wheels 5′ 6″, but unlike the South Devon, they had also tender engines of the single wheel type, with 7′ 6″ driving wheels and 6 "carrying" wheels, a good many 0-6-0 tender engines, and the famous 9′ tanks with leading and trailing bogie. They had begun to "mix" the gauge on their main line and branches. The Great Western set to work to finish the conversion.

All this I learnt long afterwards, and at that time I was completely ignorant of how these changes affected the lines about Plymouth. My boy friends and myself took little interest in the ugly old South Devon engines, and were only enthralled by the handsome London & South Western locomotives. I forgot to mention that the London & South Western goods were 0-6-0 tender engines by Beyer Peacock & Co., with the usual 5′ wheels and inside frames. They looked very fine with their brass domes. Soon the 349 class of 4-4-0's began to appear. These were far and away the biggest engines I had ever seen and were indeed some of the largest in the country at that time. They had 6′ 6″ coupled wheels and 18½″x26″ outside cylinders with straight chimneys without any moulding or copper tops. These we called American engines as the chimneys spread out a little somewhat after the style of the "diamond stacked" United States engines of those days. Indeed, they were not unlike "Yankee" locos. in many ways, though I did not understand

the difference between plate and bar frames. They were built by Sharp, Stewart & Co., the London & South Western not building any of their own engines at that time. They were not quite a success, as the boiler was too small for the cylinders but of course I did not know that.

When the Great Western took over the South Devon stock they withdrew a number of the old passenger engines and sent to Plymouth and Truro a few of their rebuilt "Penn" class. These had had 6′ driving wheels and were 2-4-0's, domeless as all Great Western were. The wheels were cut down to 5′ and a saddle tank was substituted for the tender, though some of them were left as tender engines and worked occasionally even to Plymouth. The "Gooch," "Hawk," "Avonside" and "Dewance" did so. An attempt was even made to work one of the famous 8′ singles to Plymouth but the inclines west of Newton were too steep. After one trial they were confined to the line east of Newton Abbot which became the place for changing engines on the through trains.

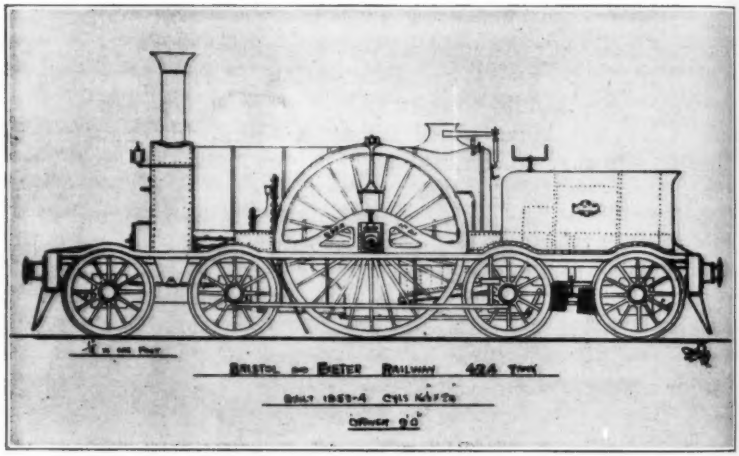
Some 0-6-0 saddle tanks were sent to work the goods and to supersede the older South Devon 0-6-0's. These new ones were built so as to be convertible to narrow gauge, and many are running today with outside frames. They were numbered 1229-1238. In 1878 came 1561-1580, similar, 4′ 6″ wheels and 17″x24″ cylinders. They were the most successful machines the Great Western had at that time for hard pulling up steep banks. Thus there were several different types of engines to be seen at Plymouth. Their classification was most confusing to me and to others. Some had names only, some both numbers and names (these were South Devon), some numbers only. We could not understand it at all and as about 1878 the London & South Western had engines without names we gave it up in despair. There was no one to explain to us. We were regarded as silly for taking any notice of such things, which "we were not meant to understand."

Another great alteration brought about by the coming of the London & South Western was the introduction of the block system of signalling, with the use of semaphore signals. The old South Devon "disc and board" signals still remained, but only as distants, and were gradually replaced as time went on.

As the line to Lydford from Tavistock J'n was single with passing places the Board of Trade insisted on the "staff" sys-

tem being adopted. No train was to leave a station without the driver having the correct staff or ticket from the signalman. No "crossing orders" were allowed, such as caused the famous Radstock disaster on the Somerset & Dorset. No collision ever occurred while the London & South Western ran over the Launceston branch in spite of the (at times) abnormal traffic.

In 1879 the Great Western "amalgamated" the South Devon and here were signs of some improvement, as if the great giant was going to rouse itself. The new "Zulu" train leaving Paddington at 3 P. M. and arriving at Plymouth at 9 P. M. was put on and corresponding 2.15 P. M. from North Road arriving



Drawn by J. W. Smith.

Paddington at 8.10 P. M., yet these were limited to 1st and 2nd class, though "express" fares were abolished. The London & South Western had trains just as good and cheaper. In 1882 this Company began running the "Alexandria," leaving Waterloo at 11.10 A. M. and arriving at Devonport at 5.10 P. M. This timing, however, proved too tight and the schedule was altered to 11 A. M. to 5.22 P. M. This quite equalled the time honored "Dutchman" on the Great Western, which left at 11.45 A. M. from Paddington and arrived at Millbay at 6 P. M. Yet the Great Western Company stated they could do no more. The broad gauge was expensive to work and Plymouth had treated

them badly. They would treat Plymouth as it deserved. These were the words of Sir A. Wood, vice-Chairman of the Board.

However, a fast train had been put on between Plymouth and Penzance, down, in connection with the Dutchman and up in connection with the Zulu. In 1882 all trains were made 3rd class except these two expresses each way. This was a "great concession," though the local non competitive fares were 1⅛c per mile and not 1c.

In 1882 the London & South Western began working their 415 class to Devonport (4-4-2 tanks). These were remarkable in having an "all over" cab, a most unusual protection for the crew. Soon after a new series of 0-6-0's appeared, the 401 class by Neilson. These had 17½x26" cylinders with 5' 2" drivers and were very powerful. They were used on the Devonport line for passenger as well as goods trains. Six wheeled gas lit thirds and 8-wheeled Composites were seen, the London & South Western being always ahead in coaching stock. By 1885 the Great Western began to realize that the old South Devon and Bristol & Exeter engines would not last for ever. One day in the summer of that year I was amazed at seeing a new 2-4-0 side tank with the stupendous number 3506 on it. This was the harbinger of nine others (convertible to narrow gauge). They had 5' driving wheels, 17"x24" cylinders and took the place of the older South Devon tanks and Great Western "Penn" type. Next year, or rather in 1887, another type of 0-4-2 saddle tanks with the same size driving wheels appeared, but they were too heavy for the road, and had to be altered to 0-4-4 side tanks afterwards. These were numbered 3541-3559 and were also "convertible." Why these high numbers were given no one could tell, as at that time the Great Western did not possess, on their own showing, 1800 engines. Perhaps it was a sort of bluffing advertisement, but Swindon was never given to that. In spite of these improvements the Great Western continued to be regarded locally with dislike and contempt. It was not till the year of revolution, 1890, that things altered.

Up to the autumn of 1886 I had never been out of my native town for a night. In 1885 I had been twice to Newton Abbot, 30 miles away, and had there seen the "Inkerman," "Sebastopol," two of the Great Western 8 footers built in 1878 as replacements of engines bearing their names. I had never even heard of them before, so my wonder was great. In addition to

these I saw 2008 and 2009, 7′ 6″, which I afterwards knew to be Britol & Exeter engines numbered in the Great Western list. But the old confusion of names and numbers continued and it was years before I learnt the truth. About this time the "English Mechanic" began opening its columns to letters about locomotives. I learnt from them about classes of engines on the London & North Western and Midland. One day a list of Great Eastern engines appeared up to 500. This came in very useful as in the autumn of 1886 I went to Cambridge. There I had all my interest in railways stimulated. The curious one-sided station, the extraordinary diversity of Great Eastern locomotives at that time, as well as the presence of Great Northern, London & North Western and Midland locomotives fascinated me. Though there were other undergraduates interested in engines we never seemed to come together. English shyness predominant as usual!

The Great Eastern was just emerging from a wild turmoil of different classes of engines under the guidance of Mr. Holden, whose new 2-4-0's of the 710 class came out in 1887. I well remember seeing the first of them on Whitsun Eve 1887. The main line trains were worked by the Worsdell compound of the 701 class 4-4-0 2-cylinder Compounds. The trains to Doncaster by the Massey Bromley 7′ 6″ 4-2-2's, magnificent looking they were. Then there were 2-4-0's of the 560, 640 type, 2-2-2's of the 290 class outside cylinder 7′ drivers, 2-4-0's and 4-4-0's (6′) of Sinclairs, which were intended for goods but worked passenger trains. These were the 1 and 2 classes. A few had been altered to 4-4-0. Then there was Adams' 4-4-0, 305, a very handsome engine. Small 2-4-0's of the 1 class, tanks 0-4-2 and 0-4-4, 0-6-0 goods engines, some small and some of the large 610 type, 0-6-0 tanks (546) for shunting and even samples of the 15 2-6-0's—the only Moguls then in England (527 class, 4′ 10″, 19″x26″ outside cylinders). Then the Great Northern had 2-2-2's new 7′ 6″, old Sturrock's 7′, 2-4-0's 6′ 6″, old 2-4-0's 6′ double frames, 0-4-2 5′ 7″, but none of the 8-footers or 0-6-0 goods ever made an appearance.

The Midland engines on the few trains run from Huntingdon over the Great Eastern line were drawn by 230 class 2-4-0's, formerly tanks with double frames. One of these was the only green Midland engine I ever saw. The red painting had come in a year or two previously.

The London & North Western branch from Bletchley was generally worked by the "Waterloo" type of 2-4-0 6′, "Saddleback," "Cuckoo" and "Wyre" being common. In 1887, just before the "race" to Edinburgh, "Waverley" and "Marmion" both appeared several times. The 3.50 P. M. from Bletchley was also often drawn by a 2-4-2T 4′ 6″. In the summer of 1887 I also saw a small 2-2-2 with inside cylinders and another with outside cylinders. These I afterwards found must have been a small Bloomer and a small "Trevithick" respectively, but as they were numbered in the 3000's I did not understand this, for I did not know about duplicates then.

On my journeys to and from Cambridge I made acquaintance with many London & South Western engines. In 1887 when the Great Western put on the "Jubilee" leaving Paddington at 1 P. M. and arriving at Plymouth at 7.30 P. M., I travelled all the way by the Great Western Ry., being drawn by "Crimea" from Paddington to Bristol. The corresponding train up I did not go by, as it left Plymouth at 12 noon and arrived at Paddington 6.30 P. M., too late to get a suitable connection to Cambridge. The 8.35 A. M. up "Dutchman" was only "one and two" and as the up 8.00 A. M. London and South Western was "third," I always went by the latter, though it kept very bad time as a rule, never entering Waterloo before 3 P. M. though due at 2.35 P. M.

The year I left Cambridge the Great Western made another "tremendous concession" as it was called. The "Zulus," up and down, were made one, two and three class and the "Dutchman" below Plymouth also. Only the 8.35 up and 11.45 A. M. down now remained sacrosanct. But the handwriting was on the wall. On the 1st of June 1890 the London & South Western opened their new double line from Lydford to Devonport via Berealston, independent of the Great Western altogether. This brought times down considerably. The 11.00 A. M. from Waterloo arrived at Devonport at 4.34 P. M. and the 5.30 P. M. at 7.55 P. M. The line entered Devonport at the other end by a tunnel. This station ceased to be a terminus, the London & South Western trains running through North Road to Laira and then backing empty to their goods station at Friary (opened in 1877 by a branch from Laira). A passenger station was opened here in 1891 and it has since been the London & South Western terminus.

In preparation for this event the Great Western resolved to surrender still more. The time honored "Cornishman" was put on, leaving Paddington at 10.15 A. M. and arrived at North Road at 3.50 P. M., with only three stops: Swindon, Bristol and Exeter. The up 2.8 P. M. was altered so as to arrive Paddington at 7.50, leaving North Road at 2.15 P. M. These trains ran fast to and from Penganee. They were 3rd class and this showed that the Great Western had decided to take up the gauntlet thrown down by the London & South Western. The older Great Western officials were now dying off and retiring. A new type were taking their place, full of vigour and eager to exploit the advantages of their system. In order to run this train, non-stop for the 52 miles from Exeter to North Road, the 3501 class of tanks were converted into tender engines, at least some of them. They were able to cope with the 1-40 banks of Hemerdon and Dainton with a load of about 120 tons. The London & South Western also ran non-stop S. Davids to Devonport, 59 miles, with their 349 class, some of which were reboilered and altered about this time.

For some years I remained in Devonport after this, and no important event took place till 1895, when the Great Western brought out their "Duke of Cornwall" class—a perfectly new departure with extended smoke box, large boiler, 18″ cylinders, Mansell wheel bogies, and 5′ 8″ coupled wheels (4-4-0). These were designed to take seven eight wheel coaches up Hemerdon. The coaches now had "corridors" and it was possible to traverse the train from end to end. The London & South Western did not adopt corridor coaches for many years after. These years also saw the growth of Plymouth as a port of call for ocean liners. Special trains were run to London from the Docks in connection with these steamers. I never saw any of the record runs. They always occurred at unearthly hours of the night. On Nov. 28, 1895 train left Millbay Pier at 7.0 A. M. and arrived at Paddington 11.47 A. M. They have continued ever since, and are a feature of the Great Western Ry. practice. In 1899 an improved type of "Duke of Cornwall" class was brought out, the "Avalon", with Belpaire fire box and no dome. These were very powerful and took eight "eights" to Newton.

I have omitted the great event of May, 1892, the alteration of the last bit of broad gauge between Exeter and Falmouth to the "narrow," now standard, gauge. This made it possible to

run through carriages and wagons to and from all parts of the north over the Great Western Ry. and proved a blow to the London & South Western Ry., who had had such an advantage in its good traffic before this. The task was a colossal one, and took two days. Regiments of plate layers from all over the Great Western system were employed. Some of the relaying had already been done in Cornwall, where doubling was in process between Lisheard and Par; but between Exeter and Tavistock Junction it was a serious operation, though everything had been done to expedite and prepare matters. The date of this was May 21st, 1892.

I saw Millbay station during the conversion. It was most curious. I also saw the last broad gauge Cornishman arrive at Millbay (not N. Rd.) and proceed on its journey to Penzance, the last broad gauge train to Cornwall. I did not see the last broad gauge train arrive at Plymouth. This was the 12.15 midnight (5 P. M. from Paddington). The Great Western were very proud of this feat, and deservedly so. It showed that the Company was indeed waking up.

Meanwhile the London & South Western were not idle. About 1892 they put on a new 1.0 P. M. from Waterloo, arriving Devonport about 7 P. M. They also quickened their 11.0 A. M. by running in the summer from Waterloo to Salisbury nonstop. But they were hampered by their heavy road which though it had no Hemerdone was continuously up hill and down dale from Basingstohe to Plymouth, with gradients of 1/80 and 1/100 continuously occurring. Although they began to adopt 8-wheel bogie stock about 1891 for all classes, the running was very rough and the oscillation at times alarming. The Great Western with all its faults had always been steadier and when it was all narrow gauge this absence of oscillation continued in spite of some severe curves.

About 1893 the London & South Western brought out a new class of 4-4-0, very powerful, the 558 class with 6′ 7″ wheels and 18″x26″ cylinders. These worked many of the Devonshire lines as well as the old 388 4-4-0's, 5′ 8″, which were sent to Exeter in 1890. These were built in 1880, and were intended for goods. In 1887, too, a class of 0-4-2 (6′) "Jubilees" were brought out. These did not appear in Devon much, but the new "Jubilees" similar but with a larger boiler took over a great deal of the working, both goods and passenger, after 1891. These were all

the design of Adams, and when he was succeeded about 1890 by D. Drummond, the London & South Western gave up the outside cylinder, and the 290 and 280 classes came with inside cylinders and a slimmer design altogether. Some of these are still running here, and have been rebuilt with super heater. About 1897 a class of 0-4-4 tanks were introduced, and tried on the Plymouth line, but after an accident near Tavistock were withdrawn, the Board of Trade disapproving of the use of such a wheel arrangement for fast trains on curving lines.

In 1903 I left Devonport to live at Egham, near Windsor, again on the London & South Western. There was little to see there of interest, only 4-4-2 tanks, 0-4-4 tanks, 0-4-2 Jubilees and the omnipresent Adams goods, several of which had preceded me from Exeter.

I am writing this in view of the famous loop outside Plymouth, where the famous "Riviera" runs daily. The advent of this train in 1904, and again in 1906, over the new "air line" from Patney to Cogload, was the final touch of the Great Western to the perfection of its service to Plymouth and Cornwall. The train ran via Bristol during the summers of 1904 and 1905, and on the opening of the new route, it commenced running all the year round on its non-stop of 225 miles. Though slowed up during the war, it was replaced as to timing in 1919, and although much heavier in weight, it still often keeps its schedule time, hauled by a "Castle."

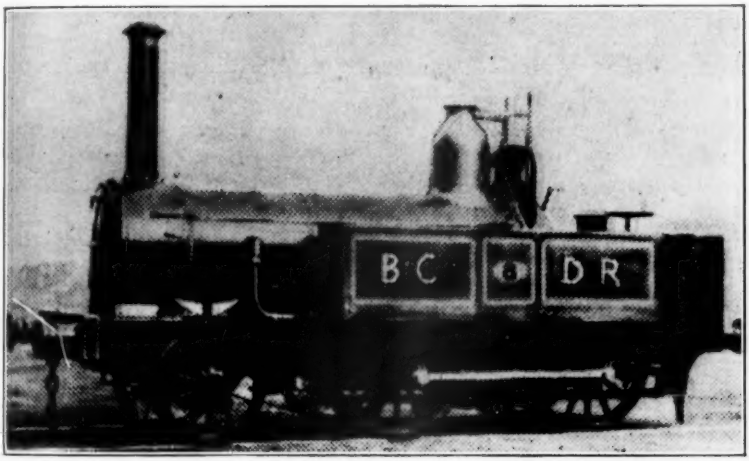
These fifty years I have seen a good deal, and if what I have written will encourage others to take and retain an interest in the picturesque and historical side of railways, I shall be quite repaid.

The Belfast and County Down Railway.

(Abridged from the Company's Official Guide).

Arranged by NORMAN THOMPSON.

The County Down Railway Company came into existence in the year 1846, in the very height of the great railway mania, the first Act authorising a line from Belfast to Downpatrick, with branches to Holywood, Newtownards, Bangor and Donaghadee. Two years later the first section was opened, the four-mile branch to Holywood.



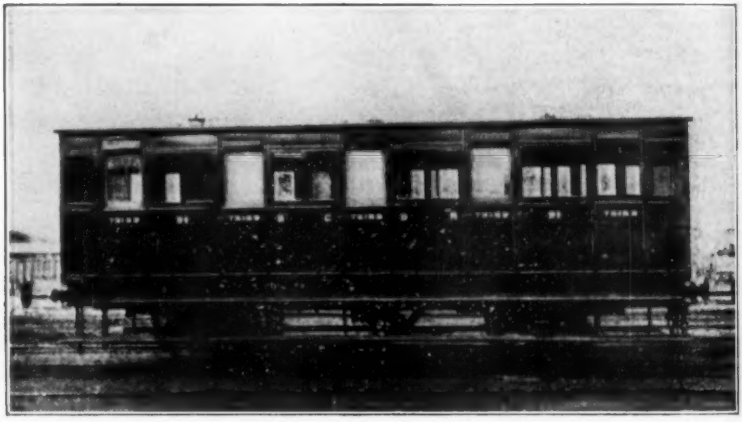
Belfast & County Down Locomotive of 1868.

The Belfast News-Letter of August 4th, 1848 states that "The line runs parallel with Belfast bay, on the County Down side, and being a perfect level, the movement is very easy. The carriages are fitted up very elegantly, and with every regard to comfort. The arrangements for the transfer of traffic are carried out with the utmost satisfaction and punctuality."

The next undertaking was of a heavier nature, the line to Newtownards, opened on 6th May 1850, the trains and station-houses being gaily decorated with flags; about one thousand passengers were carried on the first day. At this time the Holywood traffic was worked by two little tank engines about eight

feet long, weighing eight or nine tons; for the Newtownards line, four tender engines were maintained, only one of which however, saw daily use. The staff of the permanent way and locomotive departments combined consisted of four fitters, one turner, one smith, one labourer and one apprentice.

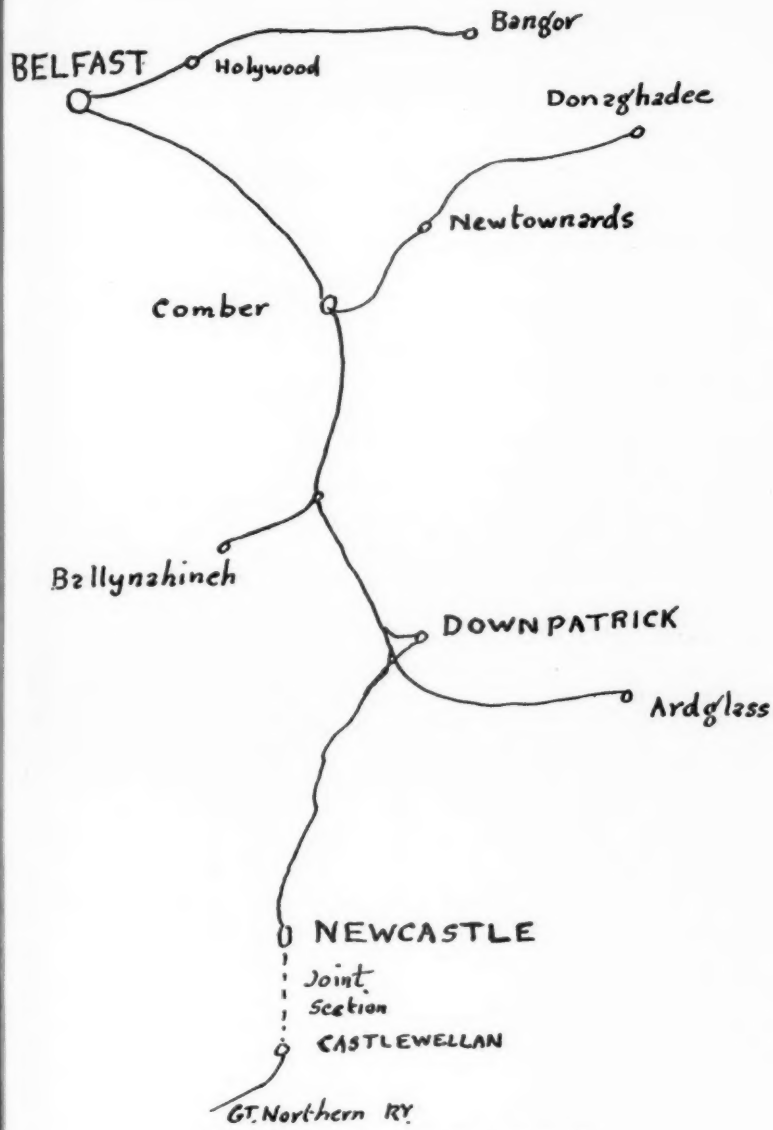
On one occasion, the only engine available being out of repair, all hands were called out—about ten in all—to push the 3 O'clock train to Holywood. Coming from Newtownards direction into Belfast terminus, a long grade is descended, and in order to save shunting, the engine was uncoupled on the hill and steamed in front of the carriages into a siding, leaving them to arrive by their own momentum. Men working near the terminus



Belfast & County Down Carriage of 1873.

assisted the brakemen, who stood on the top of a carriage, to check any superfluous speed, by throwing stones and pieces of timber on the rails in front of the vehicles. In those days the Directors took a very practical interest in the working of the railway, and were not above helping the staff by serving out tickets at holiday-time.

The next work put in hand was the extension from Comber to Ballynahinch, opened September 1858. On this auspicious day an accident of a curious nature occurred, when a stray telegraph wire caught the chimney of an engine and pulled it off, while a train was running into Belfast terminus. The damage was made good during the evening by the engineering staff.



The Belfast and County Down Railway.

In 1859 the main line reached Downpatrick, the County Seat, and the next year another company was incorporated and built from Holywood to Bangor, opening this section in 1865 and at the same time acquiring the Belfast-Holywood portion. The County Down Company leased this line in perpetuity in 1875.

The Newtownards branch was extended to the shore at Donaghdee in 1861, when vigorous preparations were in progress for operating a mail steamship service to and from Scotland, utilizing the Harbour at Donaghadee. Such a route was worked for a few years until its transfer to Larne Harbour in County Antrim.

The last portion of the main line, from Downpatrick to Newcastle, was constructed by a separate company, being opened in 1869 and worked by the Belfast and County Down Railway until 1881, when it was purchased. The Bangor line was similarly obtained in 1884, bringing up the Company's mileage to 68.

Around Downpatrick there was renewed activity in 1892, when the Ardglass Branch was opened, and the loop line across the marshes of the River Quoile appreciably shortened the distance to Newcastle. This link was laid on a thick layer of brushwood spread on the surface of the morass.

Replacement of the rolling stock then came in for attention, and some specially-powerful tank engines were put into service in handling the heavy residential traffic on the Bangor line. A non-stop run was also inaugurated between Newcastle and Belfast, a large hotel being provided by the Railway at the former point, the distance being 38 miles. Beyond Newcastle, an extension to the Great Northern terminus at Castlewellan was built as a joint project, affording a circular rail route through the Mourne Mountains district.

Tourist traffic forms a valuable asset of the system, and every effort is made to encourage it, and in this connection a couple of excursion steamers were placed in service during 1893, plying between Belfast and Bangor and points on the Antrim and Down coasts. The Belfast passenger terminus is a handsome building, suggestive of a much larger system, but although small in mileage, the traffic is heavy, and the Railway can show many features of interest in modern methods of working.